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THE MASSACHUSETTS STATE FORESTER

FRANK W. RANE

FOURTEENTH
ANNUAL REPORT
1917



BOSTON: WRIGHT AND POTTER PRINTING COMPANY, STATE PRINTERS
32 DERNE STREET

THE STATE FORESTER

OF

MASSACHUSETTS.

FOURTEENTH ANNUAL REPORT,
1917.

F. W. RANE, STATE FORESTER.



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
32 DERNE STREET.

1918.



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APPROVED BY THE
SUPERVISOR OF ADMINISTRATION.

GENERAL STATE
TO
THE DEPARTMENT

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The Commonwealth of Massachusetts.

To the General Court.

In accordance with the provisions of chapter 409, Acts of 1904, the report of the State Forester for 1917 is herewith submitted.

In the stress of war times your State Forester is firmly convinced that we should make it a patriotic duty to try to enforce the fundamental principles of forestry, both in utilizing our present forestry products in the industries, and also in providing if possible for future needs.

With appreciation of the continued co-operation and good will accorded this department in its work, this report is

Respectfully submitted,

F. W. RANE,

State Forester.

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One of the State Forester's new motor truck sprayers in operation on a State highway. The same engine that propels the truck also runs the spray pump. Three of these machines were in use throughout the past season, and easily replaced many horse-drawn sprayers.



A photograph of the State Forester's nursery at the Bridgewater State Farm in Plymouth County. Ten acres have been set aside by Colonel Blackstone for the State Forester's use. With the exception of a foreman the entire work is done by the inmates of the State Farm. The trees shown are Scotch pine transplants, and will be used with white pine in planting throughout the State next spring. There are approximately 1,000,000 trees in this nursery at present.

The Commonwealth of Massachusetts.

FOURTEENTH ANNUAL REPORT OF THE STATE FORESTER.

INTRODUCTION.

Forestry in Massachusetts in the future will be what we of to-day are far sighted enough to make it.

Massachusetts is a State that is naturally expected to be, and as a matter of fact is, a leader in most worthy undertakings, as her history shows. In forestry work a very creditable showing has already been made. We undoubtedly have the best forest fire protective system of any State. Our reforestation work is well under way, with approximately 15,000 acres set out to young forest trees. The practice of improvement thinnings and modern methods of forest management is yearly receiving more attention by woodland owners. Forest depredations of diseases and insects are given special consideration in regard to their eradication and control in this State. Yet with all our endeavors thus far, hardly more than a beginning has been made in the vast amount to be accomplished.

During the year the activities of the State Forester's Department have been more vigorously prosecuted than ever. Together with the usual work that has been reported upon from year to year, the changed conditions and new duties that have come as a result of the world war have necessarily completely altered many of our plans. While appropriations have been normal in general forestry work and gradually lessening in moth suppression, labor and materials of all kinds have greatly advanced. The department has practiced the strictest economy, and we believe a careful perusal of our activities as shown in this report will give the reader a better appreciation of our work.

In reforestation and nursery work, although labor has been scarce and high, we were able to secure enough of our old foremen and men to round out a most creditable year. While the planting season was interfered with by many rainy days, this weather was very favorable for the young trees, which came through the season in fine shape. The State Forester's nurseries everywhere are in splendid condition. One of the United States government forest officials upon a recent trip to New England highly complimented the department upon its accomplishments. Besides enough trees to use in our reforestation work, this year the State Forester has the sanction of the Governor and Council to distribute to persons who will plant them in Massachusetts not less than 1,000 nor more than 10,000 pine transplants at a fixed price of \$7 a thousand, packed for shipment at the nursery. It is believed this offer will tend to increase the interest in forest planting. Send in your orders at once if you wish to be on the list. The trees will be shipped in April. Every one interested in seeing young trees growing in nurseries should take a trip to the State Forester's nursery on the farm of the Massachusetts Agricultural College at Amherst, and to the Barnstable Nursery at Barnstable. A good beginning has been made in a transplant nursery at the State Farm at Bridgewater, where the work is done by the inmates under supervision of one of our foremen. A beginning is also being made in a similar way at the Norfolk State Hospital which it is hoped will grow in importance. Here, again, the work is done by the inmates of the institution.

During the year this department has consulted with the various county agents and schools soliciting their co-operation in forestry work, and it is believed much good will come out of our united action. The county officials are in direct touch with the landowners, and whenever an opportunity is afforded for forestry work this department can back them up with practical assistance, thereby getting something actually done. In the case of the county schools, it is an easy matter to start a small nursery here for demonstration purposes,* and if the students have the time to spare, they could be used in April and May on our reforestation work throughout the county, receiving compensation for their services. In these war times labor will neces-

sarily be hard to get; therefore, why not plan on utilizing our young men of public school age in this work? The labor necessary in transplanting small trees is well adapted to the strength of boys of twelve years or over, and the experience gained would give them an interest in forestry in the future. We ask teachers and parents to think this over and take counsel with this department.

During the year the State Forester concluded, after giving much study to the question, to redistrict the moth work. As is shown by a map elsewhere in this report, this work is now organized practically according to counties. As the work is largely confined to the eastern part of the State, all of the western counties are included with Worcester County. All of the division men in charge of moth divisions as at present constituted are provided with automobiles which enable them to cover their territories, keep them in close personal touch with local public officials, and allow them to give necessary supervision for best results. The former division men who are without automobiles will be used on special moth work that may arise in co-operation with the various divisions. This plan will also have a tendency to bring about more uniform results, and allow us to give greater concentration to projects thought worthy of more consideration. The moth work has been raised in efficiency as a whole, and it naturally follows that the local moth superintendents who are experienced, and who have the confidence of the townspeople, do not need such close supervision as in the past. It is desirable as ever to keep the machinery well oiled and in good repair, but when this is in good running order, the time, attention and expense exercised in getting these results may be utilized in other and more important directions. Now that many of the cities and towns that have long been infested and have had State aid, not only in reimbursement, but also in supplies and machinery furnished, are gradually becoming self-supporting, it becomes the State's duty to render equal assistance to those towns and cities that have more recently become generally infested and are worthy of State aid.

The State appropriation at present is but a little over one-half of what it formerly was for moth work, and with materials

greatly increased in cost, and labor more expensive, we are not in a position to do as much as heretofore. We are, however, getting more work done each year by individuals, and this, being self-supporting work, accomplishes results in the most satisfactory way. We, as a people, believe in self-reliance and self-help; the idea is associated with liberty and self-respect. Acting upon this principle, and with the belief that this is the true interpretation of the law, the State Forester has governed himself accordingly in dealing with the whole moth question. While the moth law plans for certain methods of assistance to towns from the State appropriation, this assistance is expected to be forthcoming only when it is a question of real need. One Massachusetts town deserves commendation in that while it spends large sums in excess of its liability, and could demand State reimbursement, it has never asked for one cent. The Commonwealth is to be congratulated upon such public-spirited communities as this.

A few of the main principles that the State Forester has endeavored to follow in moth work are: —

1. To develop a capable man in each city and town to have charge of the work, who has sufficient knowledge and experience to command the respect and confidence of his people.

2. To see that each town has sufficient modern equipment and materials to work with, and that they are properly cared for so that it is possible to accomplish good results.

3. To keep a practical working knowledge of moth conditions and estimates for getting results.

4. To avoid unnecessary expenses and keep the work as near self-supporting as possible.

5. To encourage private liability work, either by the local moth superintendent's force or private contractors. Whatever work is thus done lessens the infestation and betters conditions just so much, — a step in the right direction towards suppression and control.

6. To keep cities and towns that have become self-supporting from getting careless and indifferent, thus allowing bad conditions to return.

7. To assist owners of infested woodlands and forests in thinning or operating their stands, with a view to present economic utilization and future production.

8. To aid all our citizens in Massachusetts to deal with the moth problems in the very best and most economic and practical way.

9. To reduce in so far as practicable the overhead expenses of the work to a minimum, in order to make available as large funds as possible for accomplishing the practical work desired.

10. To keep at all times a clear, concise and sufficiently detailed account of the expenditures and reports of the State work, so that we may be able to inform the public how the work is being administered.

11. To co-operate with the United States government in retarding moth distribution and spread into new territory, and in aiding in the propagation and dissemination of beneficial parasites.

When we consider the voracious and tenacious habits of the gypsy and the brown-tail moth we realize the seriousness of the battle that has been fought here in Massachusetts. The State has been liberal and long-suffering and patient, but the task has been one of no small proportions, and there is still work to do. Last year, due to war conditions, we were very fearful for a while that we might be unable to get sufficient arsenate of lead for our spraying. We finally were fortunate in getting a million pounds from the west at practically double the price we had paid a few years before, and later some of our local manufacturers came to our assistance in smaller lots which carried us through the season. In order to get the larger amount into New England in time for our use due to embargoes upon railroads, a whole train load of arsenate of lead, consisting of twenty-nine cars with engine and full train crew, came through from the west intact, consigned to the State Forester of Massachusetts. The value of this cargo was \$81,000.

Again this year we are fortunate in getting arsenate of lead at a favorable price, but a considerable increase over last year. We need to exercise, therefore, every precaution the coming season in the economic use of this insecticide. In labor, spraying machines and all other equipment there is a corresponding increase. Our appropriation, therefore, is only two-thirds as effective under present conditions as normally. The brown-tail moths are practically exterminated; for the past two years they have given us very little concern. The gypsy moths are controlled in the residential parts of our cities and towns, though our woodlands generally are infested throughout eastern Massachusetts. These woodlands are receiving attention, and through modern forestry methods of thinning, combined with good results from parasites and diseases, we are making substantial gains. This is no time for the pessimist.

The section of the State experiencing the worst infestation by

the gypsy moths at present is that contiguous to Middleborough and Wareham, and further south on the Cape proper. In this region the heretofore scattering infestations have become general, and henceforth their treatment needs the same thorough methods that have been practiced in the sections in and about Boston for years.

Since the United States government has confined its attention to the control of the spread of the gypsy moth, the State Forester has not had the splendid assistance formerly given within our infested territory, and this assistance has been greatly missed.

With the government taking the responsibility of their present important work and the parasitic work, however, we can well afford to assume this extra duty, although in so doing our expense has been greater. All things considered, therefore, we feel that great and satisfactory progress has been accomplished. Without discussing the subject further, suffice it to say that we need the whole-hearted co-operation and assistance of our people in this work, as ever. We have greatly reduced our appropriation, but increased expenses in every way, due to war conditions, naturally form a great handicap. We expect your continued support and confidence in this work.

During the year the State Forester was called into conference with Mr. James J. Storrow, chairman of the fuel committee of the Public Safety Committee of Massachusetts, relative to a request from the English government for our furnishing lumber men from New England for work in Great Britain. Upon studying the matter further, I made a report recommending that we organize and equip a number of portable sawmill units similar to those commonly used in Massachusetts. From this as a beginning, under the leadership of Mr. Storrow and his active committee, it resulted that all the New England States became interested, and the project was carried out in a very creditable manner.

At the time that the ten sawmill units were being formed and equipped, a request came from Major Greeley of the Forest Service for aid in listing men for the Tenth Engineers' Corps or Forestry Regiment for service in France. The State Forester was made a recruiting officer for Boston and Massachusetts, and

Lieutenant Wolfe of the United States Forest Service was sent on to assist in the work.

More details regarding our war activities are given elsewhere in this report.

Forest fire work of the year has not changed materially from heretofore. Four new observation stations have been built during the summer, one at Prospect Hill, Waltham; one in the central part of Martha's Vineyard; one at Charlton; and the fourth at Ragged Mountain in West Brookfield. The season was a favorable one, due to frequent rain and conditions which kept the vegetation green and moist. The work of inspection of engines has been portioned out into districts, and is now done by the various district forest wardens instead of special inspectors, as heretofore. With our forest observation system and improved organization we are in better shape than ever for future emergency when dangerous seasons come.

The examination work of forest tracts, where assistance is given the owner in forestry thinning and management, has been larger than ever, as is shown elsewhere in this report.

Forest utilization has received its full attention throughout the year, and with high cost and fluctuation of labor, due to losing men who have gone to war, it has been a busy time keeping the work going. The high prices for lumber and cordwood have changed conditions very much. The cordwood that usually has been hard to dispose of is now in great demand for fuel, and at present we are exercising our ingenuity to aid all sections of the State in the campaign to cut wood for fuel and at the same time improve conditions in the woodlands. The "cut a cord of wood" campaign is just getting fairly under way.

During the past year a greater interest has developed in our State work in the care and protection of trees than has ever been shown before. The correspondence courses on shade tree management and forestry that were the outgrowth of arrangements made by the State Forester with the Massachusetts Agricultural College were heartily entered into by a large number of our men. The State Forester's division men, city foresters, moth superintendents and tree wardens were enrolled to the number of over 200. The very fact that this was a voluntary undertaking, initiated in response to a request from a few moth

superintendents,, and so heartily taken advantage of when offered, speaks for itself. When men take sufficient interest in their work to study nights and spare hours after working hard all day it shows they are interested.

Besides the above courses a splendid beginning was made the past fall in teaching these same men something of tree surgery. Arrangements were made to engage expert and experienced tree surgeons to hold demonstration schools in different sections of the State. The arrangements were made by the State Forester's division man in each case, and he was in immediate charge. It was indeed gratifying to see how readily and quickly this work was taken up by the men. It is proposed to continue this work the coming year. The past season the State Forester was much gratified to see the good work accomplished in such cities and towns as Taunton, Fall River, Springfield, Newton, Hudson, Leominster, Cohasset, Hingham, etc. The wholesome rivalry, where each man feels that his work is just a little better than the others, is also worth while. We have no desire to disparage the good work that is being done by reputable men or concerns who have accomplished splendid results, particularly upon the estates of many of our wealthy people. We do have, however, a great many trees in nearly every city and town that are needing attention at the hand of some one who is sufficiently trained and experienced to do the work intelligently, and there is plenty of work for many years to come for both the local official and the expert.

While correspondence courses on shade tree management and forestry, the practice of tree surgery, etc., are not the real field of the State Forester, nevertheless this office is constantly looked to by our people for assistance in this work. As a matter of fact, men who have had training in general forestry work are in a position to readily advise and assist in this work, as the fundamentals for success are the same. What is true of the above work is equally true of the diseases and insects common to our trees. When, therefore, last year, at the instigation of the Massachusetts Tree Wardens and Foresters Association, a bill was recommended to the Legislature for unifying the work that has to do with shade and forestry trees in general, it was believed that the time was ripe for such a step.

The bill provided for a forester in each town or city, whose duty should be to exercise the authority now vested in the offices of moth superintendent and tree warden, since it was felt that one person held responsible is more likely to get results than where the responsibility is divided. It did not pass. Perhaps its advocates are mistaken in their judgment that such a step would really be productive of good results. Until the responsibility is legally placed upon this department by the Legislature, it is in no way to blame for the maltreatment of the trees that are destroyed or disfigured by lumber, power, electricity, gas and telephone companies. The abuse of the street and roadside trees is constantly thought to be due to neglect on the part of the forestry department. It is but natural that this department should desire to make it clear that this is not the case.

The results of the cleaning work done about the shores of cranberry bogs for a certain distance back, which has been in progress for the past two seasons, thus checking the invasion of the gypsy moth larvæ, have fully demonstrated its usefulness the past season. The satisfactory conditions were brought out in one question put to the State Forester, when the feeding of the insects was at its height, by one of the members of the Cranberry Growers Association committee, who has shown great interest in the work. "Well, what would have been the conditions now, Mr. Rane, if we had not begun when we did?" The cranberry interests are large in Massachusetts, and the co-operation shown has been of the best.

The white pine blister rust that has been so prominently called to the attention of people in recent years as a menace to the white pine has received more consideration than ever during the past year in Massachusetts. The State appropriation allotted to this work was \$50,000, and the United States government was expected to spend in the State an equivalent amount. Though this work was not directly under the supervision of this department, the State Forester's organization was used by the State and government officials in carrying out the methods and plans outlined. The report of this season's work has not been received as yet, but it is hoped that some real progress will be forthcoming. In the spring the State Forester destroyed several infestations that had been found the previous season, at a time

when the infested pines were just beginning to show the fruiting spores. It will probably take time to more fully determine many important matters regarding this disease. The State Forester's Department was not responsible for the destruction of the currants and gooseberries this year, as this work was in direct charge of the State Board of Agriculture.

The three auto-truck traveling sprayers that were built for the department were used continuously throughout the season, and proved great factors in the success of the season's work. By being able to cover a much larger territory than would be possible with horse-drawn sprayers, a saving was made in both team hire and men, which is of great importance in these times.

The State Forester has addressed many important organizations during the year, chief among which have been the North Eastern Lumbermen's Association at Bangor, Me.; the New England Nurserymen's Association at New Haven, Conn.; the Society for the Promotion of Agricultural Science at Washington, D. C.; the Eastern Shook and Wooden Box Association at Boston; the Massachusetts Horticultural Society (Lowell lecturer); and the Forestry Club of the University of Maine. Other addresses, talks and meetings attended by the State Forester and his assistants this year are listed in the latter part of this report.

Other matters of importance are emphasized more in detail in this report. Your continued hearty co-operation is expected throughout the coming year by the State Forester and his co-workers and assistants.

ORGANIZATION.

There have been relatively few changes in the personnel of the working force during the year.

The general office staff remains exactly the same as last year. Among the foresters, Mr. Chas. R. Atwood, B.Sc., who was stationed at Springfield, resigned to accept the supervision of one of the sawmill units sent to England, and Mr. Herbert E. Henshaw, who for a few years previous to entering the New York College of Forestry was a foreman in the department, was appointed to fill Mr. Atwood's old position. One of the forestry foremen, Mr. J. L. Peabody, and also Mr. R. F. Wilder have

joined the colors, and are with the Twentieth Forestry Regiment, and Mr. Ainsley C. White has enlisted in the navy.

Of the moth men Mr. J. A. Farley, who was connected with the work of moth suppression for a great many years, resigned on November 21 last.

The forest fire districts have been made into five instead of four, while the positions of locomotive inspectors have been abolished, and this work distributed to each of the districts.

There have been some changes among the observers in the fire towers. Mr. Henry H. Hammond of the Chelmsford tower has died. He was a very faithful and enthusiastic forest-fire observer.

The redistricting of the moth work has been made with reference to county lines.

The present organization of the department is as follows: —

GENERAL STAFF.

F. W. RANE, B.Agr., M.Sc.,	.	.	.	State Forester.
C. O. BAILEY,	.	.	.	Secretary.
ELIZABETH HUBBARD,	.	.	.	Bookkeeper.
ELIZABETH T. HARRAGHY,	.	.	.	Stenographer.
JENNIE D. KENYON,	.	.	.	Stenographer.
MABEL R. HAMNETT,	.	.	.	Clerk.
ROBERT HARDING,	.	.	.	Office boy.

GENERAL FORESTRY.

F. W. RANE, B.Agr., M.Sc.,	.	.	.	State Forester.
H. O. COOK, M.F.,	.	.	.	Assistant forester in charge.
W. D. CLARK, M.F.,	.	.	.	Assistant forester (Amherst).
J. R. SIMMONS, B.Sc.,	.	.	.	Reforestation work.
C. R. ATWOOD, B.Sc., ¹	.	.	.	Assistant forester.
HERBERT E. HENSHAW,	.	.	.	Assistant forester (Springfield).
JAMES MORRIS,	.	.	.	Assistant.
EBEN SMITH,	.	.	.	Superintendent, Barnstable Nursery.
J. A. PALMER,	.	.	.	Superintendent, Amherst Nursery.
L. W. BRYAN,	.	.	.	Superintendent, State Farm Nursery.
J. L. PEABODY, ¹	.	.	.	Field foreman.
AINSLEY WHITE, ¹	.	.	.	Field foreman.
H. N. BUTLER,	.	.	.	Field foreman.
H. H. CHASE,	.	.	.	Field foreman.
FRED W. PARKER,	.	.	.	Field foreman.
JOHN H. SAXTON,	.	.	.	Field foreman.

¹ Enlisted.

MOTH WORK.

Staff.

F. W. RANE, B.Agr., M.Sc., . . .	State forester.
GEORGE A. SMITH, . . .	Assistant (equipment, accounts, etc.).
PAUL D. KNEELAND, M.F., . . .	Assistant (woodlands, products, etc.).
GUY W. LUCAS, B.Sc., . . .	Assistant.
LITHGOW HUNTER, . . .	Assistant.
JOHN W. ENWRIGHT, . . .	Assistant.
JOHN J. FITZGERALD, . . .	Assistant.
FRANCIS V. LEAROYD, . . .	Supplies.

District Moth Men.

- | | |
|---------------------------------|--------------------------------|
| 1. SAUL PHILLIPS, Beverly. | 4. W. F. HOLMES, Wareham. |
| 2. WM. A. HATCH, Marlborough. | 5. HARRY B. RAMSEY, Worcester. |
| 3. C. W. PARKHURST, Foxborough. | |

FOREST FIRE PREVENTION.

Staff.

F. W. RANE, B.Agr., M.Sc., . . .	State Forester.
M. C. HUTCHINS, . . .	State Fire Warden.
JOSEPHA L. GALLAGHER, . . .	Clerk.

District Forest Wardens.

- | | |
|--------------------------------|---------------------------------|
| 1. JOS. J. SHEPHERD, Pembroke. | 4. JOHN P. CROWE, Westborough. |
| 2. MINER E. FENN, Needham. | 5. ALBERT L. ORDWAY, Westfield. |
| 3. JAMES E. MOLOY, Woburn. | |

Observers.

CALVIN C. PARKER, North Harwich.	FREDERICK W. ALDRICH, Georgetown.
JOSEPH JENKINS, Barnstable.	MYLES O. BURNHAM, Manchester.
W. I. MOODY, West Falmouth.	ROBERT McLAUGHLIN, Mendon.
WALTON F. RAYMOND, Bournedale.	JOHN ROCHE, Westborough.
F. L. BUCKINGHAM, Kingston.	JAMES MALEY, Princeton.
D. M. SMITH, Waltham.	WM. E. TAYLOR, Warwick.
LAWRENCE E. SAMPSON, Middleborough.	GEORGE W. CLIFFORD, Pelham.
JOHN H. MONTLE, Fall River.	GEORGE B. SHERMAN, Brimfield.
R. J. ZILCH, Rehoboth.	CHARLES PUTNAM, Westfield.
CHAS. F. KIMBALL, Hanson.	N. C. WOODWARD, Shelburne Falls.
EDWARD D. SPRAGUE, Hingham.	H. H. FITZROY, Savoy.
JOHN H. BACON, Sharon.	ELMER HUNT, Chester.
Mrs. WM. DAY, Martha's Vineyard.	JOHN E. CURTIN, Tolland.
F. R. STONE, Sudbury.	CLAYTON BUNK, Great Barrington.
JOHN H. O'DONNELL, Wakefield.	ROBERT MILLER, Pittsfield.
LEWIS F. HAMMOND, Chelmsford.	CLIFFORD GEORGE, Williamstown.

For list of forest wardens and local moth superintendents, see page 89.



A large plantation of red pine transplants in the Barnstable Nursery. As this species is in great demand for use in mixed plantations with white pine, they are at present a very valuable stock. These trees will be used largely in our State work. Red pine seed is not to be had this spring.



White pine transplants that were set among scrub oak or acorn brush on Martha's Vineyard following a forest fire. The small trees were four years old when set three years ago, and have grown on an average from 1 to 2 feet each year during the past two years. They will undoubtedly overcome the oak.

This plantation is on the fish and game farm in the center of the island. A tract of 20 acres joining this planting was set out the past season for the Commission by this department, the species used being a mixed planting of white and red pine.

WAR ACTIVITIES.

This department has been fortunate in being able to help along the lines of war and emergency work probably more than any other State department except those especially created for the purpose. In fact, the moth thinning and utilization branch of the department is devoting practically all its energies along war lines. The war has created a tremendous and unforeseen demand for woods labor, which we have helped to supply. The fuel emergency has created a necessity for increased use of cordwood as a substitute for coal. We are helping to increase the production and supply the demand. We are supplying the army with considerable wood at a lower price than any private individuals, and thus saving the government money.

Sawmill Units sent to England.

Last April, soon after the declaration of war, Mr. Storrow, chairman of the Committee on Public Safety, received a cablegram through Colonel Gaston, from the British War Office, stating that America could help more just then in furnishing men and equipment to produce lumber and wood in England than in any other way. On account of the lack of transports it is impossible to ship the lumber from this side, and so it must be produced over there, as lumber is vitally necessary. Mr. Storrow immediately got in touch with the State Forester, and from the plans drawn up then, the ten sawmill units were organized, equipped and sent. Most of the lumbermen of New England helped in the work, but this department was the center of the activities. The State Forester acted as secretary of the general committee which had charge of the organization of the mill units. Mr. Kneeland served on three of the subcommittees which furnished the mills, the camp equipment and the men. He devoted his entire time for a month to the work. Mr. Cook, Mr. Lucas and Mr. Hunter gave considerable of their time. Charles R. Atwood, western Massachusetts field agent, went as foreman of Unit No. 1. Twelve of the woodsmen who had been working for the department went with him. Therefore this department feels that it was responsible, more than any other single body, except the Public Safety Committee, for

the success of the expedition. Within thirty days from the time the start was made, 360 experienced woodsmen with their complete equipment, everything from sawmill boilers to bean pots, including 120 horses, were placed on shipboard. The States and lumbermen of New England raised the \$150,000 to pay for them, and sent them as a gift from New England to Old England. They are now producing lumber twice as fast as anybody has done before over there with similar equipment, and doing it for half the cost. New England may well be proud of its sawmill units, and this department of its share in them. Mr. Atwood writes in October that Unit No. 1, Massachusetts State Forester's Unit, has a record for production, having cut out 18,000 feet of sawed lumber in one day. These mills began work in Scotland, some of them being on the Carnegie Estate at Ardgay, County Rosshire.

Recruiting for Forestry Battalions.

Immediately following the sawmill units, this department was requested by the United States Forest Service to assist in raising men for the so-called Forestry Battalions of the United States Army Engineer Corps. The State Forester was appointed listing agent for the recruiting of the men. For a while office room was provided for one of the officers of the regiment who aided in the listing. Since then Mr. Lucas has acted as listing agent, examining over 300 men of whom about 40 were accepted. Five different press notices were sent to the newspapers of New England to aid in the listing, and several hundred letters were answered concerning these battalions. Several of our men have already gone in them, and Mr. Kneeland and Mr. Cook were offered commissions. We are glad they did not go, as they can be of more service here.

Furnishing Wood to the Army.

Last year about 5,000 cords of wood were cut in thinning operations under our supervision. It has been possible for us to furnish about 1,400 cords of this wood to the army at a considerable saving. About 100 cords were furnished to the camp at Framingham at \$5 a cord, — less than they had been paying private contractors. About 300 cords were furnished to the

forts in Boston Harbor at several dollars under the market price. One thousand cords are being furnished to Camp Devens at a lower figure than for any wood furnished by other contractors. We also have reason to believe that by our action we have kept the prices of the wood furnished by private individuals at a more reasonable level than would have been the case otherwise. We have offered to furnish all the wood to the army at cost plus a reasonable profit, but, due to its system of contracts, the Quartermaster's Department has been unable to accept our offer. We are now cutting wood which we hope to furnish to the army on that basis another year.

FUEL EMERGENCY.

Last spring we saw the present wood shortage coming. Most of the stocks of dry wood had been exhausted and green wood was being used. Several statements were issued in which it was urged that more wood be produced as a matter of profit. Now the coal shortage has made the greater production and use of wood a war measure and a patriotic necessity. Last summer we called upon the Committee of Public Safety to help us in producing wood, but they did not deem it expedient at that time. Lately, however, the situation has become so acute that a Wood Fuel Committee has been formed to increase the wood supply. The State Forester is an active member of this committee. All possible efforts are being made through the regular channels of the thinning work to heighten wood production. A special wood-sawing machine will soon be in operation by which it is hoped that wood can be produced for the same price with regular day labor as with the cord labor, which is now almost impossible to obtain. If this machine succeeds, we hope to place several others in operation before spring. They will have a capacity of about ten cords a day. A bulletin to encourage the use and production of wood for fuel has been printed by this office. Wood will be even more necessary and important next winter than it is this, and we are bending every effort to help, and are willing to help even more if the capital can be provided. Whether the war ends soon or not, the Massachusetts woodlot will have to do a great deal toward keeping our homes warm and our industries running. All who want help in the wood question are invited to call on us.

UTILIZATION.

Special efforts have been made along the lines of utilization this past year. The idea of proper utilization is to prevent waste, and to put the tree into the products for which it is best suited, and from which the highest returns will be received. On our co-operative operations we have experimented with various kinds of products, and have thus obtained valuable practical information and data. The charcoal experiment was completed and the product has been sold. The results show that for wood at a distance from the market or the railroad, and for wood of inferior quality, charcoal has distinct commercial possibilities. We hope to publish a report on the matter a little later. Considerable practical advice on utilization has been given and used to advantage even by lumbermen. We have sold or helped to sell both wood and lumber for their producers, and are willing to help anybody along those lines without charge. We hope to be able to expand the utilization work to much larger scope in the near future, for the practice of forestry is greatly encouraged by giving the small owner of forest land an accurate idea of the use and value of forest products. With this knowledge he, the permanent holder of the land, is able to profit rather than the lumberman, whose only idea is necessarily the rapid conversion of the woodland he owns into profit.

OPERATIONS.

During the past year fifteen co-operative operations have been carried on. A list follows:—

NAME OF OWNER.	Location.	Area (Acres).	Character of Operations.
Cochituate Realty Trust, . . .	Wayland, . . .	40	Sawmill.
Mrs. Currier, . . .	Pembroke, . . .	12	Cordwood.
Joseph S. Fay, Jr., Estate, . . .	Falmouth, . . .	200	Sawmill and spraying.
George B. Fiske, . . .	Wayland, . . .	10	Sawmill.
Clifton Johnson, . . .	Hadley, . . .	5	Sawmill.
Karlstein Estate, . . .	Dedham, . . .	15	Cordwood.
William M. Kiely, . . .	Hadley, . . .	2	Sawmill.
Lawrence Minot, . . .	Wareham, . . .	80	Cordwood.
H. C. Mulligan, . . .	Wayland, . . .	25	Sawmill.
E. R. Peirce, . . .	Weston, . . .	50	Cordwood.
Arthur G. Rotch, . . .	Lakeville, . . .	150	Sawmill.
J. J. E. Rothery, . . .	Sandwich, . . .	50	Cordwood.
Joseph A. Skinner, . . .	Hadley, . . .	90	Sawmill.
Robert K. Snow, . . .	Wayland, . . .	20	Cordwood.
Robert Winsor, . . .	Weston, . . .	125	Sawmill.
Total, . . .	. . .	874	

On these operations \$50,168.81 have been spent from the capital furnished by the owners of the land; 1,470,055 feet of lumber, 9,730 railroad ties and 4,630 cords of wood have been cut. The gross returns from these operations to the owners have been or will be about \$75,000, leaving a net profit to the owners of about \$25,000. In expense is included the cost of burning brush and even of spraying in several cases. Thus it will be seen that the work was profitable. In all these operations the proper practice of forestry, that is, the removal of trees that should be cut because they were damaged or mature, and the leaving of trees that were of greater value for the future of the land, was the prime consideration rather than the gaining of the highest financial returns. However, in several cases larger returns were realized than could have been obtained by selling the growth to some lumberman who would have cut regardless of the future.

WALPOLE MUNICIPAL FOREST.

The second celebration by the townspeople of Walpole, in which all of the school children joined, was held on Arbor Day this year. Appropriate exercises were held in which the State Forester took part. At the close of the exercises each person present was requested to plant a tree in the town municipal forest. This sight in itself was interesting and well worth while. This beginning was made possible through the generosity of two public-spirited townsmen, Mr. Charles Bird, Jr., and Mr. Geo. Plympton, who conceived the idea and had it so well carried out. The example is one that will be followed, it is believed, by other cities and towns. It was a pity that a moving picture could not have been made of the hundreds of children when they were all so busily engaged in planting. It was a picture well worth preserving.

This town or municipal forest, which is now over two years old, is in close proximity to the schools and playgrounds, and will, it is predicted, prove a great and lasting tie of fellowship between the present and future generations, and besides, prove an object-lesson in practical conservation.

REFORESTING SCRUB OAK OR ACORN BRUSH LANDS.

It is believed that this class of lands which is so common on the Cape, and found here and there occasionally in other sections of the State, as on the Montague and Westfield plains, can be handled readily so that they may be reclaimed for forestry. These lands are not infrequently burned over by forest fires, and if the area is at once set in the early spring to pine transplants, preferably strong four-year-old stock, good results will ensue if the season is favorable. Our practice is to set the transplants in the open spaces between the brush, and to determine the number to plant per acre by the openings available. Generally speaking, these openings are well spaced and offer ideal conditions for work. Small white pine transplants that were handled in this way in various places are giving very encouraging results. A photograph of a planting made upon the game farm on Martha's Vineyard may be seen in this report. The photograph was taken by the State Forester on September 21 of this year, and it will be observed that the pines have made an average growth for each of the past two seasons of a foot each. That the pines have established themselves and will be able to subdue the scrub oaks there is little doubt. The transplants have been set three years in their present place. It is believed that when the pines are well established the oaks will be really of assistance, as they shade the ground in summer, and their leaves afford a mulch on the ground at other seasons of the year. Where the scrub oak is thick and large the expense of clearing it renders the undertaking impracticable, but if it can be burned over by a hot fire which is within control the conditions for planting are then considered very favorable. These experiments will be watched with interest.

THE ORIENTAL HAG MOTH.

A very severe outbreak of this insect occurred during the last summer season. This is an imported insect, found first in Dorchester in 1906. It is a very voracious feeder, and this past season stripped many fruit trees in Dorchester and Roxbury. It is hatched from the egg in July and feeds all summer, forming a hard, woody, egg-shaped cocoon the latter part of Septem-

ber or first of October. It remains as a larva in the cocoon all winter, changing to a pupa in spring and emerging an adult moth in the latter part of June. The moth then lays its eggs on leaves or twigs. Though the presence of this insect has been known since 1906, it has not spread to any extent until this season. The numbers of the insects have not seemed to be on the increase, perhaps owing to the birds or to some other unknown agency. This fall cocoons have been found as far from the original infestation as Canton. We feel it our duty, therefore, to warn the public of the danger from this insect. The larvæ have nettling hairs, and care should be used in handling them. They are also very voracious, and will strip a tree in a short time when they are plentiful. It is possible that two or three favorable seasons may greatly increase the numbers of this insect, and render it a formidable insect enemy. It is, of course, controlled by spraying at the proper season, but this will not be the same time that spraying is done for the gypsy moth. We hope that this word of warning will be unnecessary, but we feel that all persons interested in insect suppression should be on their guard.

THE TUSSOCK MOTH.

This insect has been in evidence in most sections of the State during the past season. The outbreaks at Pittsfield and Nantucket were particularly heavy. The writer has never seen so many pupæ and egg clusters as in a single colony which extended over about half an acre in the city of Pittsfield the past fall. The larvæ had literally stripped several maple trees, and the white patches practically covered everything in sight. Besides the tree trunks and limbs, telephone poles, fences, etc., were one white-coated mass. At Nantucket the infestation was generally bad throughout the town. Their natural enemies evidently were unable to keep them in check. Fortunately these insects are held in check by the same methods as are used in handling the gypsy moths, namely, by creosoting the egg masses and spraying with arsenate of lead when the larvæ are eating in the spring or summer.

FORESTRY CO-OPERATION.

Co-operation has always been a keystone in the work of the Massachusetts Forestry Department, — co-operation with the town, co-operation with other governmental agencies, and co-operation with the individual landowner. It has been our belief that a dollar of the money of the Commonwealth placed with several more contributed by town or individual, and used for forest protection or development, is more profitable for the State as a whole than the same dollar used exclusively in State work, and town or individual left to shift for themselves. In the gypsy moth and fire protection work co-operation is largely with the town, while in the utilization and forestry branches co-operation is largely with the private individual. We have added to our co-operative agencies this year the county farm bureaus. There is now one of these bureaus in each county of the State save Nantucket. These farm bureaus act as the local representatives of the United States Department of Agriculture and the Massachusetts Agricultural College, and it is our plan to make them feel that they are also representative of this department as well. To this end we have supplied them information and literature regarding the work of the department, supplied press articles for their monthly bulletins, and in other ways maintained personal contact with them. The county agents have responded to this invitation for co-operation in a most gratifying manner, and although the work is but three months old it gives indications of being a most useful experiment. Several counties also maintain agricultural schools, and these offer an inviting field for co-operation in educational work which should bring fine results. The work of teaching in these schools, and keeping in touch with the county agents, might well occupy the entire time of one assistant, and if the right man could be found would prove a valuable addition to our force.

ACTIVITIES IN GENERAL FORESTRY.

Because of the varied nature of the work of this branch of the forestry department it is difficult to express it in figures, yet the following summary may be of interest: —

Reforestation lands: —

New plantations set out, 12; 400 acres; 300,000 trees.

New plantations brushed, 8; 142 acres.

Old plantations brushed, 10; 225 acres.

Old plantations filled in, 6; 40,000 trees.

Otter River State Forest: —

Planted, 60 acres; 47,000 trees.

Brushed, 70 acres.

Nurseries: —

Transplants shipped from, 900,000.

Seedlings transplanted in, 1,560,000.

Seed beds put in, 430.

Examinations of woodlots, 104; 5,000 acres.

Surveys, 7 lots; 250 acres.

Operations supervised, 11; 150 acres.

FORESTRY EXAMINATIONS.

The examinations of private property made this year exceed in number those of previous years. It is not to be supposed that an examination ends with a visit to the land and the advice given the owner, but our service is extended to finding purchasers for the cut of standing wood, or obtaining men to do the work which was advised. There have been an unusual number of applicants seeking estimates and buyers for the standing wood and timber on their woodlots. This is due to the rapidly advancing prices of forest products, which have made many owners think of disposing of their woodlots. Some States do not make estimates, on the ground that such assistance is not the work of a forestry department, and that people should be willing to hire professional estimators for such work. We believe, however, that assisting the landowner to dispose of his woodlot, provided it is economically operated, is a legitimate part of our business, and helps in the proper use of our forests. This department welcomes and is glad to further the work of reputable professional estimators, and give reference to them for such work. We want the landowners to understand that in making estimates of woodlots this department must be fair to the possible purchasers as well as to the owners, and that we cannot make our valuations high to satisfy the seller at the expense of the purchaser.

The following table shows the kind and variety of work that

this department has been able to do in aiding our forest owners throughout the State for the past year. Again, this is independent of the moth-thinning work, which is of equal importance, although carried on by another division.

LIST OF FOREST EXAMINATIONS, 1917.

NAME.	Town.	Area (Acres).	Problem.
Ashton, Harriett, . . .	Middleton, . . .	50	Cutting.
Bacon, F. W., . . .	Newton, . . .	5	Trimming and cutting.
Baxter, Adelaide A., . . .	North Weymouth, . .	27	Thinning.
Bell, E. H., . . .	Southampton, . .	200	Cutting, thinning and estimate.
Bemis, A. A., . . .	Spencer, . . .	90	Chestnut blight.
Bill, N. B., . . .	South Worthington, . .	40	Blister rust and weevil.
Brooks, Merrill D., . . .	West Granville, . .	30	Thinning.
Brown, Alice M., . . .	Williamstown, . .	30	Cutting.
Brown, Charlotte, . . .	Concord, . . .	8	Cutting.
Burnham, F. E., . . .	Essex, . . .	40	Blister rust.
Cambridge, city of, . . .	Fresh Pond, . . .	10	Aphis.
Channing Sanitarium, . . .	Wellesley, . . .	50	Chestnut blight thinning.
Chapin, C. H. B., . . .	Tolland, . . .	300	Cutting and planting.
Clark, A. B., . . .	Palmer, . . .	25	Chestnut blight cutting.
Cook, Martha, Heirs, . . .	Stowe, . . .	36	Cutting.
Curtis, Miss R. E., . . .	Brighton, . . .	1	Tree diseases.
Dexter, Mr., . . .	Blandford, . . .	5	Insects.
Durant, Clark T., . . .	Great Barrington, . .	6	Thinning and planting.
Eastman, Chase, . . .	Newton, . . .	6	Thinning and insects.
Fall River, city of, . . .	South Park, . . .	-	Tree diseases.
Fessenden, R. G., . . .	Concord, . . .	40	Improvement thinning.
Fengstedt Bros., . . .	Bedford, . . .	20	Estimate.
Fitzpatrick, T. B., . . .	Hopkinton, . . .	50	Thinning, insects and diseases.
Forant, Mrs., . . .	Warren, . . .	40	Thinning.
Framingham Country Club, . .	Framingham, . .	8	Cutting and thinning.
Frothingham, Mrs. Channing, . .	Walpole, . . .	46	Thinning.
Frothingham, Randolph, . .	Beverly Farms, . .	-	Blister rust.
Gay, George M., . . .	Hampden, . . .	75	Chestnut blight thinning.
Geer, J. T., . . .	Three Rivers, . .	30	Thinning and planting.
Gillett, Edgar L., . . .	Westfield, . . .	150	Estimate.
Goodale, J. L., . . .	Ipswich, . . .	10	Blister rust and planting.
Goodwin, Fred S., . . .	Dover, . . .	185	Thinning.
Hall, H. P., . . .	Sandisfield, . . .	200	Planting.

LIST OF FOREST EXAMINATIONS, 1917 — *Continued.*

NAME.	Town.	Area (Acres).	Problem.
Heald, J. M.,	Lincoln,	20	Thinning and planting.
Healy, John J.,	Charlemont,	180	Cutting and improvement thinning.
Helburn, J. W.,	Williamsville,	190	Thinning and planting.
Hillside School,	Greenwich Village,	20	Cutting.
Homans, Mrs. John,	Canton,	10	Thinning and planting.
Johnson, Margaret,	East Freetown,	70	Thinning and cutting.
Knittle, Fred,	Blandford,	50	Thinning.
Lawrence, H. H.,	Concord,	77	Thinning.
Leclear, Mrs. Gifford,	Brewster,	38	Thinning and planting.
Leonard, Fannie G.,	Raynham,	16½	Reforestation.
Lowney, Walter M.,	Mansfield,	4	Weevil.
Loyd, Mrs. S. L.,	Williamstown,	4	Estimate.
Ludden, Myron,	Spencer,	30	Cutting and estimate.
Lynch, J. C.,	Stockbridge,	70	Planting.
Marble, Frank E.,	Lynnfield,	20	Burn.
McSweeney, Edward F.,	Hudson,	6	Burn.
Meadowbrook Golf Club,	Reading,	10	Thinning.
Melbourne, Sydney J.,	East Longmeadow,	57	Cutting.
Melbourne, Sydney J.,	East Longmeadow,	75	Cutting.
Metropolitan Park Commission,	Blue Hills,	—	Blister rust.
Morse, Arthur M.,	Sudbury,	10	Thinning and planting.
Morton, Margaret B.,	Plymouth,	—	Shade trees.
Munroe, Elmer E.,	Wellesley,	3	Tree diseases.
Munson, W. A.,	Huntington,	50	Cutting and chestnut blight.
Newburyport Water Commis- sion.	Newburyport,	40	Thinning and planting.
Newburyport, city of,	Newburyport,	—	Tree diseases.
New England Kennel Club,	Braintree,	40	Thinning and planting.
Nichols, Lesley A.,	North Reading,	4	Thinning and spraying.
Norfolk State Hospital,	East Norfolk,	25	Thinning and planting.
Osgood, Isaac,	North Andover,	10	Thinning and estimate.
Packard, Martha W.,	Andover,	1	Spraying.
Palmer, Mrs. E. H.,	Reading,	6	Blister rust.
Parker, Charles H.,	Cotuit,	75	Thinning.
Peck, Robert E.,	Brimfield,	50	Blister rust.
Peters, William Y.,	Dover,	116	Thinning.
Phelps, James F.,	West Lynn,	1	Chestnut blight.
Phinney, F. F.,	Sturbridge,	200	Thinning and planting.
Pond, George K.,	Leyden,	80	Planting.

LIST OF FOREST EXAMINATIONS, 1917 — *Concluded.*

NAME.	Town.	Area (Acres).	Problem.
Prengle, Ralph, . . .	North Reading, . .	5	Thinning and spraying.
Richardson, Miss Clara, . .	Methuen, . . .	14	Estimate.
Ross, John A., Jr., . . .	Newburyport, . .	45	Thinning.
Sabin, Mr., . . .	Hadley, . . .	22	Thinning.
Seavey, Herbert, . . .	Stoughton, . . .	80	Chestnut blight cutting.
Seymour, Mrs. S. P., . . .	Granville, . . .	100	Estimate and type map.
Shaylor, W. M., . . .	Tyringham, . . .	42	Estimate.
Shaylor, W. M., . . .	Warren, . . .	83	Chestnut blight.
Shores, Harvey T., . . .	North Bernardston, .	400	Thinning and planting.
Simpson, C. B., . . .	South Easton, . .	4½	Burn.
Skinner, Joseph A., . . .	South Hadley, . .	25	Reforestation.
Smith, Irving, . . .	Ashburnham, . .	150	Estimate.
Smith, Frank B., . . .	Worcester, . . .	250	General.
Snow, F. H., . . .	Conway, . . .	50	Thinning and planting.
Stearns, Francis N., . . .	Adams, . . .	-	Moths.
Stockbridge, town of, . . .	Stockbridge, . . .	53	Improvement cutting.
Swift Estate, . . .	Wellesley Hills, . .	10	Chestnut blight thinning.
Thompson, George M., . . .	Wakefield, . . .	-	Aphis.
Wilkins, James H., . . .	Carlisle, . . .	24	Thinning.
Williams, H. S., . . .	Springfield, . . .	25	Cutting.
Windsor, S. S., . . .	Walpole, . . .	1	Shade tree.
Woods, Nesbit L., . . .	Dunstable, . . .	150	Cutting and planting.
Daniels, Caroline T., . . .	Medway, . . .	30	Estimate.
Haven, F. S., . . .	Weston, . . .	15	Thinning.
Hunt, Daniel, . . .	Marshfield, . . .	20	Thinning.
Keith, Harry, . . .	East Bridgewater, .	4	Blister rust.
Newburyport, city of, . . .	Newburyport, . .	-	Tree diseases.
Parmenter, H. F., . . .	Wayland, . . .	8	Estimate.
Pearson, Gardner W., . . .	Dracut, . . .	80	Reforestation.
Plymouth Water Works, . .	Plymouth, . . .	20	Thinning and planting.
Spencer, Geo. P., . . .	Oakham, . . .	60	Thinning.
Weld, Stephen M., . . .	Dedham, . . .	50	Blister rust.
Wheeler, William, . . .	Concord, . . .	16	Cutting.
Total (104 examinations), . .	. . .	5,308	



One of the tracts turned over to the State Forester and planted under the reforestation act, showing the young white pine trees just beginning to free themselves through the grass and weeds.



A photograph taken just three years later of the same plantation as above. This view was taken from the field on the left in the above view looking on to the hill (Christian Hill, Colrain).

REFORESTATION.

The number and area of plantations deeded to us under the terms of the reforestation law exceeded those of last year, and is well up to the average of previous years when the lots which were purchased are deducted from the total. The amount of caretaking work done on plantations of previous years was about the same as that done in 1916. The tables give this information in detail. The small motor truck which we purchased last fall was of great assistance in transporting men and trees, and enabled us to do more work with fewer men, an important consideration in these times of labor shortage. Several of our plantations showed an unusual number of trees affected by pine weevil. During the summer we used two crews of men making a tree-to-tree inspection of these plantations and cutting and burning the infested shoots. Experiment has shown that if this method is followed for two or three years the weevil can be controlled in great part.

NEW WORK.

[S. p.=Scotch pine; w. p.=white pine; r. p.=red pine; s.=spruce; A. p.=Austrian pine.]

Number.	NAME. •	Town.	Area (Acres).	Trees planted.	Acres brushed.
134	Crocker, . . .	Barnstable, . . .	32	15,000 S. p.	32 ¹
133	Simpkins, . . .	Yarmouth, . . .	12	7,500 S. p.	12
				7,500 w. p.	
136	French, . . .	Rutland, . . .	26	9,000 w. p.	-
				9,000 r. p.	
137	Wire company, . . .	Spencer, . . .	8	4,500 w. p.	-
				4,500 s.	
139	Perry, . . .	Falmouth, . . .	18	1,750 A. p.	9
				1,750 S. p.	
140	Snow, . . .	Conway, . . .	74	21,000 w. p.	-
				22,000 s.	
141	Pond, . . .	Leyden, . . .	61	20,000 w. p.	-
				20,000 s.	
143	Town, . . .	Berkley, . . .	12	-	12
144	Flint, . . .	Andover, . . .	6	2,000 w. p.	-
				2,000 A. p.	
145	Schoonmaker, . . .	Ashburnham, . . .	38	15,000 w. p.	-
				5,000 s.	
				9,000 r. p.	
				5,000 A. p.	
147	Geer, . . .	Belchertown, . . .	6	3,000 w. p.	-
				3,000 A. p.	
148	Sills, . . .	Shelburne, . . .	33	13,000 w. p.	-
				10,000 s.	
150	Estabrook, . . .	Fitchburg, . . .	7	-	4 ²
151	Estabrook, . . .	Lunenburg, . . .	6	-	2 ¹
124	Hansen, . . .	Marlborough, . . .	95	18,000 w. p.	60
				14,000 r. p.	
				4,000 S. p.	
135	Smith, . . .	Barnstable, . . .	10	-	10
	Totals, . . .	. . .	445	-	140

¹ Thirty cords of wood were taken out.

² Twenty cords of wood were taken out.

³ Twenty-five cords of wood were taken out.

MAINTENANCE WORK.

[W. p.=white pine; A. p.=Austrian pine; N. s.=Norway spruce; r. p.=red pine.]

Num-ber.	NAME.	Town.	Area (Acres).	Trees planted.	Acres brushed.	Trees from which Weevil was taken.
1	Fenno, . . .	Westminster, . . .	40	-	- ¹	150
7	Flint, . . .	Andover, . . .	40	10,500 w. p. 1,000 A. p.	-	-
13	Wilson, . . .	Spencer, . . .	5½	-	5½	337
12	Wilson, . . .	Spencer, . . .	23	-	-	463
11	Wilson, . . .	Spencer, . . .	45	-	-	1,405
20	Eames, . . .	Paxton, . . .	55	-	-	1,704
25	Sohier, . . .	Rowley, . . .	8½	1,000 w. p.	-	-
27	Greenwood, . . .	Gardner, . . .	93	-	-	4,000
30	Cowles, . . .	Belchertown, . . .	10	-	10	150
43	Barr, . . .	Spencer, . . .	-	-	-	56
44	Clark, . . .	Holden, . . .	-	-	-	250
45	Stone, . . .	Brookfield, . . .	-	-	-	520
46	Fullam, . . .	West Brookfield, . . .	115	9,000 N. s. 5,000 w. p.	- ² 30	-
52	French, . . .	Hubbardston, . . .	40	-	40	-
59	Bolton, . . .	Shirley, . . .	20	-	20	-
73	Walworth, . . .	Barre, . . .	35	-	25	-
81	Glazier, . . .	Leverett, . . .	24	-	24	-
82	Glazier, . . .	Leverett, . . .	66	-	66	-
112	Perry, . . .	Medfield, . . .	12	1,000 r. p. 1,000 w. p. 500 N. s.	-	-
114	Tower, . . .	Manchester, . . .	4	500 w. p.	-	-
119	Browne, . . .	Marlborough, . . .	33	6,000 w. p.	14	-
91	Rice, . . .	Spencer, . . .	200	-	-	4,355
75	Robertson, . . .	Oakham, . . .	85	-	-	587

¹ Thirty cords of wood were taken out.² One hundred and sixty cords were taken out.

NURSERY WORK.

No important changes were made in our nursery work during the year. Our three principal nurseries at Amherst, Barnstable and the State Farm were continued as usual. The shipments of stock for planting on our own lands were somewhat greater than

in the previous year, while the demands for stock by agencies outside of our department were considerably less. The amount of transplanting at Amherst and Barnstable was about the same as last year, but the transplanting work at the State Farm was very considerably restricted by the lack of two-year seedling stock. Some transplants were set out at the auxiliary nurseries at the Myles Standish State Forest and at Norfolk State Hospital, but no more stock was transplanted at the Otter River State Forest. In spite of advancing labor costs the nursery expense was about the same as last year, and considerably less than two years ago. The outstanding feature of our nursery situation at this time is the immense number of four-year transplants, nearly 2,000,000, which we have on hand for use next spring. As this number is double the number required for our own needs we have decided to make use of the privilege granted to us by law to sell this stock at cost to private owners, under certain restrictions approved by the Governor and Council. We will also have on hand more than the usual number of two-year seedlings ready for transplanting.

STOCK SHIPPED FOR PLANTING ON REFORESTATION LOTS.

NURSERY.	Species.	Class.	Number.
Amherst,	White pine,	3-year,	15,600
Amherst,	White pine,	4-year,	158,325
Amherst,	Red pine,	4-year,	44,000
Amherst,	Austrian pine,	4-year,	8,000
Amherst,	Norway spruce,	3-year,	10,000
Amherst,	Norway spruce,	4-year,	55,350
Amherst,	Scotch pine,	4-year,	9,000
Total, . . . .	. . . . .	. . . . .	299,675
Barnstable,	White pine,	4-year,	20,400
Barnstable,	Scotch pine,	4-year,	750
Barnstable,	Red pine,	4-year,	3,000
Barnstable,	Austrian pine,	4-year,	1,000
Barnstable,	Norway spruce,	4-year,	22,950
Total, . . . .	. . . . .	. . . . .	48,100
Grand total, . . . .	. . . . .	. . . . .	347,775

STOCK SHIPPED FOR PLANTING ON STATE FORESTS.

NURSERY.	Species.	Class.	Number.	State Forest.
Barnstable, . .	White pine, . .	4-year, . . .	29,000	Myles Standish.
Barnstable, . .	White pine, . .	4-year, . . .	7,000	Otter River.
Barnstable, . .	White pine, . .	4-year, . . .	3,000	Harold Parker.
Barnstable, . .	Red pine, . . .	4-year, . . .	9,600	Myles Standish.
Barnstable, . .	Red pine, . . .	4-year, . . .	7,000	Otter River.
Barnstable, . .	Red pine, . . .	4-year, . . .	3,000	Harold Parker.
Barnstable, . .	Scotch pine, . .	4-year, . . .	5,700	Myles Standish.
Barnstable, . .	Austrian pine, .	3-year, . . .	10,000	Myles Standish.
Barnstable, . .	Austrian pine, .	4-year, . . .	5,000	Myles Standish.
Barnstable, . .	Norway spruce, .	4-year, . . .	10,500	Myles Standish.
Barnstable, . .	Larch,	3-year, . . .	11,000	Myles Standish.
Total, . . . .	. . . . .	. . . . .	100,800	
Myles Standish, .	Scotch pine, . .	3-year, . . .	10,000	Myles Standish.
Amherst, . . .	White pine, . .	4-year, . . .	15,000	Otter River.
Amherst, . . .	White pine, . .	4-year, . . .	16,000	Savoy.
Amherst, . . .	Red pine, . . .	4-year, . . .	5,000	Otter River.
Amherst, . . .	Larch,	2-year, . . .	13,000	Otter River.
Amherst, . . .	Norway spruce, .	4-year, . . .	6,000	Savoy.
Total, . . . .	. . . . .	. . . . .	55,000	
Grand total, . .	. . . . .	. . . . .	165,800	

STOCK SHIPPED TO SUBNURSERIES.

NURSERY.	Species.	Class.	Number.	Subnursery.
Barnstable, . .	White pine, . .	2-year, . . .	25,000	Myles Standish.
Barnstable, . .	White pine, . .	2-year, . . .	5,000	State Farm.
Barnstable, . .	White pine, . .	2-year, . . .	25,000	Norfolk Hospital.
Barnstable, . .	Scotch pine, . .	2-year, . . .	107,000	Myles Standish.
Barnstable, . .	Scotch pine, . .	2-year, . . .	46,000	State Farm.
Barnstable, . .	Scotch pine, . .	3-year, . . .	60,000	Myles Standish.
Barnstable, . .	Austrian pine, .	2-year, . . .	15,000	State Farm.
Barnstable, . .	Norway spruce, .	2-year, . . .	44,200	State Farm.
Total, . . . .	. . . . .	. . . . .	327,200	

STOCK SHIPPED OUTSIDE DEPARTMENT.

CONSIGNEE.	Address.	Species.	Class.	Number.	Nursery.
Barnard, J. H.,	Greenbush,	Hemlock,	4-year,	500	Amherst.
		White pine,	4-year,	1,500	Barnstable.
		Scotch pine,	4-year,	500	Barnstable.
		Red pine,	4-year,	500	Barnstable.
		Norway spruce,	4-year,	500	Barnstable.
Concord Water Board,	Concord,	White pine,	4-year,	1,500	Amherst.
		Red pine,	4-year,	1,500	Amherst.
		Norway spruce,	4-year,	500	Amherst.
Cushing, C. W.,	Lunenburg,	White pine,	4-year,	22,500	Amherst.
		White pine,	4-year,	5,000	Barnstable.
		White pine,	4-year,	10,000	Barnstable.
Fish and Game Commission,	Martha's Vineyard,	Austrian pine,	4-year,	5,000	Barnstable.
		Red pine,	4-year,	5,000	Barnstable.
		Assorted,	4-year,	2,100	Barnstable.
Haskins, F. L.,	Norwell,	White pine,	4-year,	3,000	Amherst.
		Norway spruce,	4-year,	3,000	Amherst.
Gardner Colony,	Gardner,	White pine,	4-year,	1,000	Barnstable.
		Assorted,	4-year,	500	Amherst.
Lutheran Home,	Avon,	White pine,	4-year,	2,000	Amherst.
		Assorted,	4-year,	200,000	Amherst.
Massachusetts Agricultural College,	Amherst,	White pine,	2-year,		
McSweeney, E. F.,	Hudson,	White pine,			
Metropolitan Park Commission,	Blue Hills,	White pine,			

STOCK SHIPPED OUTSIDE DEPARTMENT — *Concluded.*

CONSIGNEE.	Address.	Species.	Class.	Number.	Nursery.
Metropolitan Water Board,	Fayville,	White pine,	2-year,	50,000	Barnstable.
Moth superintendent,	Bolton,	White pine,	4-year,	3,000	Amherst.
Moth superintendent,	Harvard,	White pine,	4-year,	3,000	Amherst.
Moth superintendent,	Hudson,	White pine,	4-year,	3,000	Amherst.
Norfolk Hospital,	East Norfolk,	White pine,	4-year,	6,000	Barnstable.
		Red pine,	4-year,	1,000	Barnstable.
		Norway spruce,	4-year,	500	Barnstable.
Parkhurst, C. W.,	Foxborough,	Norway spruce,	4-year,	2,000	Barnstable.
Park board,	Plymouth,	Assorted,	4-year,	1,000	Barnstable.
Park board,	Swampscott,	White pine,	4-year,	1,500	Barnstable.
		Scotch pine,	4-year,	500	Barnstable.
Peirce, E. R.,	Wellesley,	White pine,	4-year,	15,000	Amherst.
Smith School,	Northampton,	White pine,	4-year,	500	Amherst.
Spring, Russell,	Newton,	White pine,	4-year,	1,000	Amherst.
State sanatorium,	Westfield,	Red pine,	4-year,	500	Amherst.
		White pine,	4-year,	500	Amherst.
Water works,	Hudson,	White pine,	4-year,	13,000	Amherst.
		Larch,	4-year,	300	Amherst.
Water board,	Newburyport,	Norway spruce,	4-year,	5,000	Barnstable.

Totals for Amherst, 274,800; for Barnstable, 98,600; grand total, 373,400.

INVENTORY OF STOCK, STATE FOREST NURSERIES, 1917.

Barnstable.

SPECIES.	5-Year Trans- plants.	4-Year Trans- plants.	3-Year Trans- plants.	2-Year Seedlings (Beds).	1-Year Seedlings (Beds).
Red pine,	-	150,000	180,000	-	-
White pine,	20,000	200,000	350,000	225	150
Austrian pine,	-	10,000	-	-	-
Arbor vitæ,	-	25,000	-	-	-
Fir balsam,	-	15,000	-	-	-
Spruce,	3,000	50,000	-	58	20
Scotch pine,	-	-	-	40	-
Banks pine,	-	-	-	-	18
Larch,	-	-	-	6	-
Totals,	23,000	450,000	530,000	329	188

Amherst.

White pine,	-	833,000	166,000	195	160
Red pine,	-	23,000	2,000	18	-
Scotch pine,	-	62,500	192,000	-	72
Austrian pine,	-	-	25,000	-	-
Yellow pine,	-	-	42,000	-	-
Loblolly pine,	-	-	-	-	2
Banks pine,	-	-	-	-	5
Arbor vitæ,	-	4,000	-	-	-
Hemlock,	-	2,000	-	-	-
Norway spruce,	-	-	275,000	9	-
Totals,	-	924,500	702,000	222	239

Norfolk.

White pine,	-	25,000	25,000	-	-
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Otter River.

White pine,	-	140,000	-	-	-
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Myles Standish.

Scotch pine,	-	-	150,000	-	-
White pine,	-	-	25,000	-	-
Total,	-	-	175,000	-	-

INVENTORY OF STOCK, STATE FOREST NURSERIES, 1917 — *Concluded.**State Farm.*

SPECIES.	5-Year Trans- plants.	4-Year Trans- plants.	3-Year Trans- plants.	2-Year Seedlings (Beds).	1-Year Seedlings (Beds).
White pine,	-	-	50,000	-	-
Scotch pine,	-	760,000	27,000	-	-
Austrian pine,	-	3,700	12,000	-	-
Norway spruce,	-	-	40,000	-	-
Totals,	-	763,700	129,000	-	-
Grand totals,	23,000	2,300,000	1,560,000	550	427

STATE FOREST ADMINISTRATION.

Although the law puts the care and administration of the State forests in the hands of the State Forester, he has no appropriation for this purpose, so that by arrangement with the State Forest Commission such funds as the forestry branch can spare are expended on the Otter River State Forest, while the Commission uses some of its funds on the other State forests, — the Myles Standish, Harold Parker and Savoy Mountain.

Otter River State Forest. — During the past year we have reforested 60 acres of land and cleared of brush and small wood about 70 acres additional. The expenditure of \$1,600 is only about one-half that of the previous year. Although there is very little valuable cordwood on this reservation, our men have been cutting gray birch fuel wood in order to aid in the local fuel supply. The present time is an excellent one in which to dispose of this wood, which under ordinary circumstances is not salable.

We have asked Mr. Haynes, engineer for the State Forest Commission, to give us a brief outline of the work done on the other State forests by the State Forest Commission under his supervision, and his statement here follows: —

Up to Nov. 30, 1917, there have been acquired by purchase by the State Forest Commission, under the Acts of 1914, chapter 720, approximately 11,000 acres of land comprising four separate State forests, as follows: —

1. The Otter River State Forest (1,700 acres), situated in the townships of Winchendon, Royalston and Templeton, in Worcester County.

2. The Myles Standish State Forest (7,000 acres), situated in the townships of Plymouth and Carver, in Plymouth County.

3. The Harold Parker State Forest (1,100 acres), situated in the townships of Andover, North Andover and North Reading, in Essex and Middlesex counties.

4. The Savoy State Forest (1,200 acres), situated in the township of Savoy, in Berkshire County.

These State forests are comprised to a considerable extent of waste land, and the act calling for its acquisition had for its main object the reclamation of waste land areas, *i.e.*, the gradual substitution of stands of forest trees of value to replace the worthless growth now covering a certain percentage of the area of all four forests. The State Forester is under the law given control and management of these tracts, and is charged with the responsibility of the proper prosecution of the necessary reclamation work that should be and must be done if the objects for which these tracts are being acquired are to be achieved and the values possible of being secured in the future are to become tangible. Owing to the fact that the State Forester has no fund available with which to prosecute the needed work to any material extent, it has again been necessary for the State Forest Commission to expend a portion of its funds during the past year in planting and protective and improvement work.

The State Forest Commission during the past year planted on the Myles Standish State Forest 232,000 plants, consisting of red, Scotch, Austrian and white pine, and Carolina poplar, to all of which plants the section is well adapted; also 102,000 seedlings were set in a nursery on the reservation, several miles of roads were cleared, fire equipment purchased, and a camp suitable for caring for twenty-five men was fitted up. On the Otter River State Forest the fire lines were replowed and some improvement work was done on the buildings on the reservation. On the Harold Parker State Forest and Savoy State Forest a total of about 30,000 pine and spruce transplants were set. With the exception of 40,000 poplars all of the transplants and seedlings were furnished from the nurseries of the State Forester. The plants in all cases have done well, and the percentage of those alive in the fall of 1917 will run over 95.

During the past three years there has been expended by the Commission on the State forests along such lines as planting, fire protection, equipment, and improvement work, approximately \$8,560.

Expenditures for 1917 on State Forests.

In accordance with the provisions of section 3, chapter 720, Acts of 1914, the State Forester herewith gives a statement of the expenditures on each State forest for the past year.

Otter River State Forest.

Surveying,	\$373 68
Planting, ¹	934 32
Brush cleaning,	788 58
House and miscellaneous expenses,	279 82
Nursery work,	111 00
Land purchase,	10 85

 \$2,498 25
Savoy State Forest.

Line work,	\$145 05
Planting, ¹	240 32
Land purchase,	6,051 59

 \$6,436 96
Harold Parker State Forest.

Surveying,	\$496 91
Planting, ¹	108 44
Land purchase,	291 12

 \$896 47
Myles Standish State Forest.

Brushing,	\$24 50
Surveying,	93 00
Fire lines and roads,	1,105 88
Planting, ¹	2,849 50
Nursery,	337 00
Miscellaneous account,	683 10
Land purchase,	35 45

 \$5,128 43

FINANCIAL STATEMENT.

General Forestry and Nurseries.

Appropriation for 1917,	\$20,850 00
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Expenditures:—

Salaries,	\$8,412 76
Travel,	2,777 20
Printing,	433 03
Stationery and postage,	45 46
Maps, photos, etc.,	2 98
Sundries,	573 06
Supplies and equipment,	122 72

¹ Figures on planting include price of trees furnished from the State Forester's nursery.

Nursery: —

Pay roll,	\$7,165 86
Travel,	4 91
Seeds and seedlings,	590 30
Teams, freight and express,	330 68
Equipment,	299 52
Telephone and sundries,	90 45
	<hr/>
	\$20,848 93

Balance returned to treasury Nov. 30, 1917, \$1 07

Purchase and Planting of Forest Lands.

Appropriation for 1917, \$10,000 00

Expenditures: —

Pay roll,	\$8,630 36
Land,	182 50
Travel,	303 39
Express, freight and teams,	313 07
Equipment,	488 44
Postage,	20 00
Printing,	18 20
Sundries,	32 45
	<hr/>
	9,988 41

Balance returned to treasury Nov. 30, 1917, \$11 59

MOVING PICTURE REELS.

The three films owned by the department, each demonstrating different phases of our work, namely, (1) reforestation and nursery work, (2) forest fire work, and (3) suppressing gypsy moths, have been utilized for many special occasions during the year, both in Massachusetts and in exchange with other States. At the present time duplications are being made by the war department from these films for interesting our soldiers in the field in the work.

CREOSOTING GYPSY MOTH EGG CLUSTERS.

Year by year finds us perfecting our methods and always ready to try new methods. The fact that labor is scarce, and equipment and finances harder to get, makes us practice every economy possible. Realizing the high cost of spraying material, and that the coming season will test our every energy, the

division moth men were called in to a conference, and we decided that a definite drive be made on curtailing every cent possible in the creosoting work this fall and winter, that the money thus saved might be used for spraying.

The creosoting of egg clusters is a proper remedy, and where judiciously done is very effective. The great trouble is that it may be overdone, as there is a danger of expending too much labor in this work. If one is depending solely upon creosoting to keep the gypsy moth in check he may be justified in a greater expenditure, but if, as is more commonly practiced, the trees are to be sprayed, the amount of creosoting necessary will depend entirely upon how bad the conditions are. The local moth superintendent should be able to advise on this matter. The practice of climbing trees and treating with creosote is largely eliminated, as the method is expensive. It should not be said dogmatically that this should never be done, however, for there are times when it is advisable. A good moth superintendent or forester must use his judgment at such times. Results are desired, but economy must be considered in getting them. Quick and effective so-called ground work, wherein the expense is kept low per acre, may be advisable, but the time-killing and painstaking practices of the past in tearing down stone walls and looking into every crevice with reflecting mirrors are out of date. Creosote, therefore, is only a means to an end, and better and more effective practice in suppression is spraying with arsenate of lead. Caterpillars are bound to eat, and poisoning them is sure to get effective results.

AUTO-TRUCK SPRAYERS.

The three new auto-truck sprayers that were built for this department proved, as was anticipated, to be great factors in our work the past season, enabling us to accomplish what otherwise would have been practically impossible. These sprayers were used almost entirely upon the highways and to supplant the horse-drawn sprayers that have been in use heretofore. In order to get the greatest amount of good out of them a regular route was outlined in advance for each outfit. A crew of three to accompany each, a mechanic and driver combined and two nozzle men, was selected, who remained with the machine throughout

the spraying season. This crew was under direct charge of the division moth men while within their respective territories. The crew was provided with a camping outfit which was used provided other arrangements could not be easily planned for. Without explaining more in detail, the great advantages can readily be seen for the use of this equipment. The motor power for quick and effective work as compared to horse-drawn sprayers is self-evident. The auto truck requires but one man, an engineer and chauffeur combined, while a horse-drawn power sprayer requires two men, — an engineer and a driver. With the plans perfected for the work, water available and plenty of spraying material on hand a great amount of territory can be covered each day. The great drawback that must be encountered, however, is the inclement or rainy weather. The past season's plans were greatly interfered with, and the sprayers were unable to keep on schedule time for this reason. The United States government has four of these auto-truck sprayers in use, and are building three more. A photograph of one of our sprayers at work is shown in this report. The spraying attachments are easily removed, and the truck may be used for other purposes after the spraying season. Already a few cities and towns have truck sprayers. The question of their practicability and economy rests with the amount of work to be done, particularly the kind of work that requires a large amount of travel, like roadside spraying. Where this is not necessary a horse-drawn sprayer will do equally good work at less expense.

MOTH-THINNING WORK.

During the past year the division of this department, which originated the moth-thinning work, has finally so broadened as to embrace the whole field of forestry operations and forest utilization. When the work was started as a separate branch of the department, nearly five years ago, the need was for public education in the value of moth thinnings as a means of moth control, and for practical demonstration of the efficacy and financial success of these thinnings. That stage has now completely passed. Moth thinnings have come into almost universal practice throughout the infested region. They are paying for themselves in most cases, saving a large expenditure

of money which would go in other means of moth control, and are bringing into use a considerable amount of forest material which would be wasted if not cut in thinnings.

A great opportunity is now before us. The years of patient education along forestry lines, added to the present unequaled demand for forest products of all kinds, have opened the minds of the woodland owner to the idea of conservation. Forestry along lumbering and utilization lines now has a chance to make good. The waste and desolation following the usual lumbering operations have brought about a reaction. The ravages of the gypsy moth and the chestnut blight, together with the potentialities of the pine blister rust, have made the forest owners wish to take account of stock and look toward the future. They want to operate conservatively, and to keep the forest land productive if they can see that it pays. It is our idea that if forestry does not pay 100 cents on a dollar plus interest, then it is no good. We know that it pays. We hope to take advantage of our opportunity and prove that it pays. Thus the moth-thinning work has developed into what might be called a forestry operating work. We are willing to co-operate with any person who wishes to cut his woodland conservatively, under practically the same terms as those under which the moth-thinning operations have been carried on; that is, the owner furnishes the capital and we supervise the operation and dispose of the product without charge except for traveling expenses.

During the past year, to help the moth-thinning branch of the department in its war and operating work, the forestry branch has undertaken to make practically all preliminary examinations, whether forestry or moth examinations. If the examinations developed so that further help or advice along operating or utilization lines was necessary, then the moth-thinning branch was called in. This management has resulted in a great saving of time and standardization of advice given. During the past year 22 new examinations covering 2,208 acres were made by the moth-thinning branch. Besides that about 40 examinations were made as called upon by the forestry branch.



A plantation of white pine on poorer or gravelly soils about rich bog lands, typifying the ideal conditions for cranberry bogs; hardwoods, the natural food of gypsy moths, replaced by pine, which is ten times as valuable and flourishes in light soils, — a solution of the moth trouble about cranberry bogs.



A typical example showing how young white pine trees may be utilized to fill in open and barren spaces in forests. These trees have been set out only three years, and are well established (Ashburnham).

REPORT OF DR. L. O. HOWARD, UNITED STATES ENTOMOLOGIST.

DEC. 19, 1917.

Prof. F. W. RANE, *State Forester, State House, Boston, Mass.*

DEAR PROFESSOR RANE: — I enclose a report on the parasite situation, which you are at liberty to use in your annual report.

Following my report to you of a year ago, I am now sending you a statement as to the conditions of the parasites which in earlier years have been imported under the joint effort of this Bureau and the State of Massachusetts in the effort to control the gypsy moth and the brown-tail moth. I have not had the opportunity during the past year to visit the parasite laboratory, except once in the early spring, and the paragraphs which follow are taken from a report on present conditions submitted to me by Mr. A. F. Burgess of this Bureau, in charge of the moth work.

The parasite work has been continued along similar lines as in the past few years. It has not been possible to introduce parasites from abroad owing to war conditions in Europe. Colonization of the parasites already introduced over the entire territory infested by the gypsy moth is being attempted, and several of the species are now established in practically all the infested area in Massachusetts.

The egg parasites, which spread much slower than some of the strong flying species, have been given special attention the past year as far as colonization is concerned.

Anastatus bifasciatus was colonized in 46 towns in Massachusetts during the spring of 1917, 1,722 colonies having been liberated. This species has become well established in most of the colonies previously placed in the field. Collections from colonies liberated in 1910 and 1911 have been examined, and the parasitism was found to range from 30 to 41 per cent.

Schedius kuanæ was collected in a few places in Massachusetts in October and November, as most of the stock available this year was used in Maine and New Hampshire. Over 200,000 specimens were liberated, most of them being placed in woodland in Norfolk.

The parasitism by this species in old colonies has been gradually increasing during the last two years, and many collections this fall have shown that over 30 per cent. of the eggs were destroyed by this parasite.

Apanteles melanoscelus, the hymenopterous species which attacks the gypsy moth caterpillars, was found more abundant this year than heretofore, and it was possible to liberate several new colonies. Only a small number of individuals of this species were originally introduced, and considerable more work must be done in colonizing it throughout the infested region.

Compsilura concinnata was not as abundant generally as heretofore, although in some localities it caused very heavy inroads on the increase of the gypsy moth.

Blepharipa scutellata, a tachinid parasite which was introduced a number

of years ago, and which has never been found in the field in large numbers, was recovered from several localities in eastern Massachusetts this year. From some of the collections of gypsy moth pupæ that were made a very high percentage of parasitism resulted, and it is hoped that this species will continue to increase.

The *Calosoma* beetle was slightly more effective this year than during the previous year. Extreme abundance of the species, however, was local rather than general. In some localities large numbers were present, and this resulted in the destruction of many gypsy moth caterpillars and pupæ.

The brown-tail moth was much less abundant this year than heretofore, and very few localities are known at the present time where the infestation is at all serious. Collections of webs were made during the winter and many caterpillars dissected. This work resulted in showing a very high percentage of parasitism. Breeding records during the spring and summer gave similar results.

Zygobothria nidicola was reared in large numbers from some of these collections, and this parasite was found over a much wider area than had been previously recorded.

The results of the work are encouraging, but the problem is complex and requires a large amount of investigation and study.

Yours most truly,

L. O. HOWARD,
Chief of Bureau.

GYPSEY MOTHS AND CO-OPERATIVE CRANBERRY WORK.

This work has continued as heretofore in the cranberry-growing sections of the State. The same method of State aid has been followed that is in vogue in general moth work. The town first expends its liability, and each bog owner is assessed for his individual liability. These funds are first spent before any reimbursement can be expected from the State. The understanding is that when any co-operative work is done about a bog, thereafter the bog is to be kept in condition by the owner without future assistance from the State. The cleaning of the shores about bogs is being quite universally practiced, and is of great assistance in keeping the crawling larvæ from reaching the bogs after they have stripped the surrounding woodlands. The spread of the very young larvæ by the wind is best overcome by spraying the vines with arsenate of lead. It has been reported by Mr. J. J. Walsh, the Wareham superintendent, that effective results against the moths were secured this year by flooding the bogs when the moths are in the pupa stage.

PASTE V. POWDERED ARSENATE OF LEAD.

The paste form of arsenate of lead is and has been the standard insecticide in our campaign against the gypsy moth for years. It has the proper spreading and adhesive qualities upon the foliage, mixes readily in water, and does not burn the foliage. This insecticide was the creation of the old Massachusetts moth department of the Board of Agriculture, and was given to the world unpatented. It is now probably the standard arsenical insecticide in use, even supplanting Paris green.

During recent years a new form of arsenate of lead has gradually come into use. This is the powdered, or dry, lead. At first, like nearly every new undertaking, this proved unsatisfactory, probably the greatest objection being its tendency to burn the leaves. It did not adhere to the foliage as well as the paste, and then, again, some trouble was experienced in keeping it sufficiently dry. A still further claim that the powdered form was much cheaper for the ingredients it contained did not prove true on analysis. This was, of course, a further consideration. The objectionable features of the dry lead, however, have gradually been done away with, and last season many of the cities and towns used more or less of it, and are planning to do so the coming season. One city forester is so well pleased with the dry form that he is using one-third dry to two-thirds paste next season.

The State Forester is in no way prejudiced in this matter, and only desires that in changing from a well-tested and satisfactory insecticide to a new one no mistakes are made. While we have not tested out all of the brands of dry arsenate, we are still convinced that there is much that should be known before recommending them for general use. This whole subject will be given more careful consideration and observation the coming season. Considering the bulkiness and extra expense of handling the 50 per cent. water in the paste lead, it is well worth determining whether we can use the dry lead to good advantage.

MEETING OF GYPSY MOTH OFFICIALS AT THE STATE HOUSE.

On March 15 a meeting of the gypsy moth officials of the State was held at the State House at the call of the State Forester, and it proved one of the largest gatherings of these

men that has ever been assembled. Every phase of the moth work was discussed by various speakers. The convention was honored by an address by His Excellency, Lieutenant-Governor Calvin Coolidge. The State Forester reviewed the work of the year. Mr. Burgess and Mr. L. H. Worthley, representing the United States government, discussed the parasitic work and the methods of handling the spread of the moths. Prof. W. D. Clark of Amherst gave a talk on correspondence courses and their value to practical workers. Paul D. Kneeland spoke on the subject of moth-control methods by practical forestry utilization. Mr. J. G. Gordon of Lowell discussed methods of interesting property owners in the work. There was plenty of time for an open discussion which was general, and the day was well spent. The attendance was over 200.

MEETING OF TOWN OFFICIALS AND MOTH SUPERINTENDENTS AT BOURNE.

The moth officials of the whole Cape country, including also the towns of Plymouth, Carver, Middleborough, Lakeville and Marion, were called together in Bourne at the town hall on Wednesday, September 19. They were authorized to invite their selectmen and any other citizens likely to be interested to attend. The day was spent in the discussion of the whole moth question, with particular emphasis upon the district under consideration. Besides the State Forester, Mr. Walter F. Holmes, the new district moth superintendent, spoke relative to future plans; also Assistant Forester Paul D. Kneeland outlined the work in progress in forest thinnings and utilization of tree growth and its relation to moth work, and Mr. George Smith discussed the question of equipment for spraying. It is hoped that a better understanding of the aims and purposes of the work may have resulted as the outcome of this meeting. It is desired that the coming season may also result in more co-operation than ever. The State Forester certainly desires to render every possible service to this section the coming season.

SPECIAL MOTH WORK AT NANTUCKET.

During the past season the citizens of Nantucket and the summer people became very much exercised over the prevalence of insect pests on the island, particularly on their shade trees

in the residential sections of the town. A tussock moth outbreak, the second within a few years, together with a gradual increase of the gypsy moth, due to slack methods of control, occurred last summer, threatening the tree life of the island. The presence of these hordes of caterpillars aroused the interest of the town in general, and, at an invitation extended by the board of selectmen and the Improvement Association, the State Forester made an investigation of conditions on the island and addressed a public meeting at which the chairman of the board of selectmen presided. Later a special town meeting was held, at which time a special appropriation was made, and the State Forester was asked to supervise the work. The appropriation was made at too late a date to do a great amount of work this fall; however, a thorough inspection of the trees was made by Mr. Smith and Mr. Fitzgerald of this department, and a few men were instructed to do the necessary creosoting of egg clusters. Plans were also perfected for additional spraying machinery for use next spring, and a beginning was made upon treating tree cavities, of which there are many needing attention.

Nantucket people are alive to the seriousness of the situation, and it remains for the State Forester to get results. He feels sure these can be accomplished through the splendid co-operation of the committee appointed to assist him. The work will be taken up again next spring and pushed vigorously to completion.

CHESTNUT BLIGHT.

There is nothing new to be said about this disease other than to emphasize what has already been stated. The disease is apparently as virulent as ever. When riding on the train from Boston to Pittsfield in August, a time when the conditions were just right to show its development, the woodlands exhibited a peppered condition of either dead or dying chestnut everywhere. The problem is one of utilization and rebuilding the forest stand with some other species. Much of the chestnut wood has been cut for poles, ties and cordwood during the year, and fortunately the markets have been good for handling it. Under ordinary times the cordwood would have been practically worthless.

THE STATE FIRE WARDEN'S REPORT.

MR. F. W. RANE, *State Forester*.

SIR: — In compliance with your request, and in accord with the provisions of chapter 722, section 2, Acts of 1911, I beg to submit the following report of the work accomplished by this branch of the department this year.

The season of 1917 has been a comparatively favorable one from the standpoint of forest fire protection. The rainfall for the season was slightly above normal, and, with the exception of the months of July and November, was quite equally distributed throughout the year. During November the precipitation was 63/100 of an inch, the lowest record for this month in one hundred and five years, the drought lasting over a period of twenty-two days. In spite of favorable climatic conditions throughout the greater part of the season there has been an increase in the number of fires reported over the record of last year. However, through the efficient work of our observers, together with prompt co-operation on the part of the town and district forest wardens, we have experienced no disastrous fires, and the property damaged is slightly lower than that of a year ago.

Owing to the resignation on July 1 of Mr. Oscar L. Noyes of Byfield, Mass., district forest warden of the first district, the work in that district for the balance of the fiscal year has been carried on by the locomotive inspectors. It has seemed best in the interests of increased efficiency, without additional expense, to redistrict the State, adding one new district and making the division along county lines. In connection with the rearrangement of districts, and for the same reason of increased efficiency, a change has been made in the method of locomotive, portable sawmill and steam-roller inspection. Through an agreement with the Public Service Commission and the several railroads throughout the State we have received permission to assign the locomotive inspection work to the district forest wardens, who will examine locomotives operating in their respective territories and make report of such inspections to this department. It is believed that this will be an improvement over the former system under which two inspectors covered the entire State, for the reason that in addition to reducing the cost of inspection it will allow inspections to be made over the whole State in the early spring and in the fall, at which seasons it is essential that locomotives be in perfect condition if fires from this source are to be prevented. The inspection of portable sawmills and steam rollers will also be assumed by the district men. The new arrangement of districts is as follows: District No. 1 to include Essex and Middlesex counties, under the supervision of Mr. James E. Moloy, formerly locomotive inspector; District No. 2 to include Norfolk and Bristol counties, under the supervision of Mr. Miner E. Fenn, formerly locomotive inspector; District No. 3 to include Plymouth, Barnstable, Dukes and Nantucket counties, under the supervision of Mr. Joseph J. Shepherd, district forest warden; District No. 4 to include

Worcester and Franklin counties, under the supervision of Mr. John P. Crowe, district forest warden; District No. 5 to include Berkshire, Hampden and Hampshire counties, under the supervision of Mr. Albert R. Ordway, district forest warden.

The law relative to the disposal of slash and brush from wood and lumber cutting operations has been more rigidly enforced this year than in the past, with the result that many miles of slash along railroads and highways have been disposed of. Owing to the large number of wood-cutting operations being carried on throughout the State this winter, we shall undoubtedly have more slash and brush left on the ground than in former years. This means an increased fire danger to contend with in many localities.

It is certainly very gratifying to note the large number of towns throughout the State that are using automobile equipment, either wholly or in part, for forest fire work. The tendency is certainly changing rapidly from the horse-drawn to the motor-driven apparatus. We have a large number of towns where the forest fire work is carried on by or in cooperation with the fire department, and in such cases the department combination truck is usually used for running to forest fires. For large or remote fires this is frequently supplemented by the older and slower horse-drawn wagon. The above conditions probably apply more generally to central and eastern Massachusetts than to the western part of the State.

Owing to favorable weather conditions during June, July and August we were able to discontinue fifteen of our stations for several weeks, and to use a number of the observers in the construction work and in painting the observation towers.

A considerable amount of construction work has been completed during the past year. A new tower 50 feet high has been erected on Martha's Vineyard, on land purchased from Capt. B. C. Cromwell adjoining the fish and game reservation in the central part of the island. This tower is equipped with stairs, and allows an unobstructed view of practically the entire island. The towns, together with several residents of the island, contributed very liberally towards the purchase of this tower.

A new 60-foot tower with stairs has been erected on Prospect Hill in Waltham. This station covers several thousand acres of very dangerous fire territory, where we have had some of the most damaging fires during the past four or five years. The cities of Waltham and Newton and the towns of Lexington and Wellesley contributed towards the purchase of this tower.

At Middleborough stairs have been installed in the tower in place of the ladder that has been in use there for some two or three years. The town of Middleborough appropriated \$150 towards the purchase price of the stairs, and the work of construction was assumed by this department.

A new 50-foot tower with stairs has been erected on Little Mugget Hill, Charlton. This station will cover about 150,000 acres of forest lands. The several adjoining towns contributed towards the purchase price of the tower. Iron stairs were installed in our tower at Mendon.

A new 50-foot tower has been purchased for erection on Ragged Mountain in West Brookfield. Cement abutments have been constructed, but owing to insufficient funds it was found necessary to postpone the erection of the tower until another season. This will be done early this coming spring, when the station will be placed in operation.

The tower purchased last spring for Watatic Mountain has been erected during the past season and 2 miles of telephone line has been constructed. This is a 40-foot tower equipped with fire-escape stairs.

The efficiency of our Mount Tom station has been greatly increased by a new arrangement with the Holyoke Street Railway Company, whereby we are given the use of the cupola of the Summit House. Heretofore our observer has used the public observation room which, besides being some 40 feet lower than the cupola, is frequently crowded with visitors, making accurate work on the part of the observer more or less difficult. The new observation room has been equipped with the new regulation map, alidade and telephone.

Several of our towers were painted during the spring and early summer, and a considerable amount of work was done on roads leading to a number of them. A majority of our stations are now easily accessible to automobiles, and the number of visitors is consequently large.

It seems quite necessary that one more station be added to our system if we are to protect the valuable forest area in the towns of Acushnet, Rochester, Fairhaven, Marion and Mattapoisett. The desirable location for this station seems to be Mendall Hill in Acushnet, and if sufficient funds can be raised in the towns which would receive protection from such a station we shall probably erect a tower at this point.

We have recently arranged for the purchase of a site on Robbins Hill, Chelmsford, where we have maintained a small windmill type of tower for the past five years. This tower has proved very unsatisfactory both in design and elevation, and as soon as negotiations for the acquisition of land are completed, and sufficient funds have been contributed by the surrounding towns, we shall proceed with the erection of a large 75-foot tower to replace the one now in use. In spite of the defects mentioned above, this station has proved a valuable one, and with a standard tower giving 40 feet additional elevation it should become one of the best in the State.

TOWNS RECEIVING FIRE-EQUIPMENT REIMBURSEMENT DURING YEAR 1917.

Ashland,	\$10 00	Lunenburg,	\$89 63
Avon,	13 42	Russell,	7 12
Belchertown,	12 85	Savoy,	26 25
Bellingham,	4 63	Southampton,	33 50
Dunstable,	54 00	Southwick,	9 00
Georgetown,	53 52	Sunderland,	24 00
Groveland,	62 75	Tolland,	25 00
Hampden,	5 49	Whately,	20 75
Harwich,	15 00		
Holbrook,	13 00	Total,	\$479 91

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT.

TOWNS.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire Brooms.	Wagons.	Reimburse- ment.
Acushnet, . . .	1	10	18	-	-	-	4	1	-	-	-	2 ^{1,3}	\$250 00
Ashburnham, . .	-	-	8	-	-	-	-	-	-	-	-	-	25 00
Ashby,	-	-	48	-	-	-	2	2	-	6	-	1	250 00
Ashfield, . . .	-	-	33	-	-	-	-	-	-	-	-	-	99 00
Ashland, . . .	-	24	12	-	-	-	12	8	-	6	24	-	95 78
Auburn,	-	-	83	-	-	-	-	-	-	-	-	-	249 00
Avon,	-	10	-	-	-	-	22	-	5	-	-	-	23 32
Becket,	-	14	16	-	-	-	-	2	-	-	24	-	79 50
Bedford,	1	14	24	-	-	-	-	-	-	-	-	1 ²	249 67
Belchertown, . .	-	-	46	12	-	-	-	1	-	12	-	1 ¹	224 72
Bellingham, . .	-	46	27	-	-	-	6	-	-	8	24	1 ¹	151 40
Berkley,	-	36	24	-	-	-	-	-	-	-	-	-	162 00
Berlin,	2	10	38	-	-	1	12	-	3	12	-	1 ¹	241 45
Blandford, . . .	6	1	16	-	-	-	3	3	-	-	12	-	83 17
Bolton,	-	14	33	-	-	-	6	-	-	6	-	-	126 65
Boxborough, . .	1	12	30	-	-	2	-	-	3	4	3	1 ¹	182 80
Boxford,	-	24	16	-	-	-	-	-	-	-	12	-	51 75
Boylston,	-	-	66	-	-	-	24	-	-	28	-	-	243 61
Brimfield, . . .	-	10	48	-	-	-	-	-	-	-	-	-	170 25
Brookfield, . . .	-	66	25	-	-	-	-	3	-	24	24	-	127 00
Burlington, . . .	-	-	20	-	-	-	-	-	-	-	-	-	100 00
Carlisle,	2	15	19	-	2	-	6	-	1	6	12	1 ²	250 00
Charlton,	-	-	77	-	-	-	4	-	-	6	-	-	250 00
Chatham,	2	5	11	-	2	3	4	-	3	5	-	1 ¹	152 98
Chester,	-	37	15	-	-	-	-	5	-	-	12	1 ¹	156 97
Chesterfield, . .	-	-	25	-	-	-	-	-	-	-	-	-	75 00
Colrain,	-	-	10	-	-	-	-	-	-	-	12	-	43 75
Cummington, . .	-	-	19	-	-	-	-	-	-	-	-	-	102 12
Dana,	-	-	6	-	-	-	-	-	-	-	-	1 ³	250 00
Dighton,	5	8	26	-	1	-	-	-	5	2	30	2 ¹	242 89
Douglas,	-	75	50	-	-	-	-	-	-	-	-	-	180 25
Dunstable, . . .	2	25	22	-	1	-	4	-	3	6	6	1 ¹	164 69
East Longmeadow,	2	-	18	-	2	-	12	3	-	4	-	1 ¹	164 46
Edgartown, . . .	2	5	10	-	2	3	4	-	3	5	-	1 ¹	152 17
Enfield,	-	20	27	-	-	-	-	-	-	-	-	-	85 87

¹ One-horse.² Two-horse.³ Motor truck.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT
ACT — *Continued.*

TOWNS.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire Brooms.	Wagons.	Reimburse- ment.
Erving, . . .	-	-	27	6	-	-	-	-	-	18	-	-	\$94 52
Essex, . . .	-	24	12	-	-	-	-	-	-	-	-	-	37 80
Florida, . . .	-	-	8	-	1	-	5	1	-	-	-	-	31 25
Freetown, . . .	-	24	20	-	-	-	-	2	-	72	-	-	167 48
Georgetown, . . .	-	54	66	-	-	-	-	-	6	24	-	-	250 00
Gill, . . .	-	5	20	-	-	-	-	-	-	-	-	-	65 00
Goshen, . . .	-	12	58	-	-	-	-	-	-	-	-	-	244 05
Gosnold, . . .	-	8	12	-	-	-	-	-	-	-	-	-	55 40
Granby, . . .	-	12	12	-	-	-	-	-	-	-	-	-	39 90
Granville, . . .	-	10	22	-	-	-	-	-	-	-	-	2 ¹	203 50
Greenwich, . . .	-	-	18	-	-	-	-	-	-	-	-	-	60 45
Groveland, . . .	-	18	22	-	-	-	-	-	5	24	12	-	113 80
Hadley, . . .	-	-	15	-	-	-	-	-	-	-	-	-	75 00
Halifax, . . .	-	12	64	-	-	-	12	-	-	18	-	1 ¹	241 91
Hampden, . . .	-	-	24	1	-	-	24	-	6	6	18	-	94 55
Hancock, . . .	-	9	-	-	-	-	-	2	-	-	6	-	14 37
Hanson, . . .	-	6	24	-	-	-	6	-	-	5	-	21 ³	250 00
Harvard, . . .	2	7	29	-	2	3	-	-	3	12	-	1 ²	250 00
Harwich, . . .	-	-	14	-	-	-	-	2	-	-	-	2	79 50
Holbrook, . . .	-	12	31	-	-	-	-	7	-	-	48	-	203 25
Holland, . . .	-	-	8	-	-	-	-	-	-	-	-	-	25 00
Hubbardston, . . .	-	-	52	-	-	-	18	-	-	4	-	-	175 75
Kingston, . . .	-	-	24	-	-	-	-	-	-	-	-	2 ¹	108 00
Lakeville, . . .	-	20	17	-	-	-	-	-	-	-	-	-	80 00
Lanesborough, . . .	2	5	8	-	3	-	-	3	6	6	48	1 ¹	131 50
Leverett, . . .	2	20	16	8	2	4	-	2	4	8	-	2 ¹	160 17
Leyden, . . .	16	10	10	17	-	-	-	-	4	8	-	-	31 55
Littleton, . . .	-	-	6	-	-	-	-	-	-	18	-	-	34 87
Lunenburg, . . .	2	36	30	-	2	3	4	-	3	29	-	1 ¹	250 00
Lynnfield, . . .	-	35	20	-	-	-	-	10	-	-	6	2 ¹	249 95
Mashpee, . . .	6	24	25	-	-	-	12	-	-	12	-	1 ¹	157 12
Mendon, . . .	-	24	21	-	-	-	-	-	-	-	42	1 ¹	173 97
Merrimac, . . .	-	-	15	-	-	-	-	-	-	-	-	-	75 00
Middleton, . . .	-	12	16	6	2	-	-	-	-	5	-	-	157 69

¹ One-horse.² Two-horse.³ Motor truck.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT
ACT — *Continued.*

TOWNS.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire Brooms.	Wagons.	Reimburse- ment.
Millis, . . .	-	-	8	-	-	-	-	-	-	-	-	1 ²	\$242 00
Monterey, . . .	-	-	-	-	-	-	-	3	-	-	12	-	15 25
Montgomery, . . .	-	-	-	-	-	-	-	4	-	-	-	-	17 00
New Ashford, . . .	-	-	-	-	-	-	-	4	-	-	4	-	18 25
New Braintree, . . .	-	-	37	-	-	-	-	-	-	-	6	-	122 85
New Salem, . . .	-	55	20	-	-	-	-	-	-	-	-	-	100 50
Newbury, . . .	-	-	6	-	-	-	-	8	-	-	12	-	55 90
Norfolk, . . .	-	-	18	-	-	-	-	-	-	-	-	-	99 00
North Reading, . . .	-	-	38	-	-	-	-	-	-	-	12	1 ¹	250 00
Northborough, . . .	-	-	25	-	-	-	-	-	-	-	-	-	102 37
Norton, . . .	-	2	8	-	-	-	-	-	-	12	12	1	241 25
Norwell, . . .	6	-	32	-	-	-	12	-	-	12	-	1 ¹	250 00
Oakham, . . .	-	12	31	-	1	1	6	-	3	3	-	1 ¹	226 97
Otis, . . .	-	5	10	-	-	-	-	1	-	-	-	-	66 75
Paxton, . . .	3	-	28	12	-	-	-	-	-	6	-	-	105 87
Pelham, . . .	-	-	19	-	-	-	-	5	-	-	-	-	84 12
Pembroke, . . .	-	-	31	-	-	-	60	-	-	-	-	1 ²	250 00
Petersham, . . .	2	10	36	-	2	3	4	-	3	5	-	1 ¹	248 05
Phillipston, . . .	-	36	38	-	-	-	-	1	-	-	-	-	130 15
Plainfield, . . .	-	-	30	-	-	-	-	-	-	-	-	-	146 25
Plainville, . . .	2	10	22	-	2	3	4	-	3	5	30	1 ¹	228 75
Plympton, . . .	-	-	-	-	-	-	-	12	-	18	-	-	25 66
Prescott, . . .	-	100	10	-	-	-	-	-	-	-	-	-	58 03
Princeton, . . .	-	32	80	-	-	-	-	-	-	-	-	-	249 20
Raynham, . . .	3	46	30	-	6	3	12	-	9	15	-	3 ¹	222 23
Rehoboth, . . .	-	10	48	-	-	-	-	-	-	-	-	1 ¹	250 00
Richmond, . . .	-	15	31	-	-	-	4	-	-	12	-	-	109 20
Rochester, . . .	-	24	60	-	-	-	-	-	-	30	-	-	205 37
Royalston, . . .	3	20	32	30	2	2	12	-	-	42	-	2 ¹	250 00
Russell, . . .	-	10	39	-	-	-	-	1	-	4	12	1 ¹	227 37
Rutland, . . .	-	12	18	-	-	-	6	-	-	-	-	1 ³	250 00
Salisbury, . . .	6	-	47	-	10	-	29	-	-	11	-	-	250 00
Sandwich, . . .	22	12	36	-	-	2	-	-	-	24	-	1 ¹	245 60
Savoy, . . .	-	-	-	-	-	-	-	5	-	-	-	-	26 25

¹ One-horse.² Two-horse.³ Motor truck.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT — *Concluded.*

TOWNS.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire Brooms.	Wagons.	Reimbursement.
Shelburne, . . .	-	-	50	-	-	-	-	5	12	6	-	1	\$186 87
Shirley, . . .	-	48	42	-	-	-	-	-	-	-	-	-	166 50
Shutesbury, . . .	-	28	25	-	-	-	23	-	-	6	-	-	101 25
Southampton, . . .	-	10	-	-	-	-	-	5	-	-	12	-	42 25
Southwick, . . .	-	13	26	12	-	-	3	2	-	24	-	1 ¹	131 07
Sterling, . . .	-	-	25	-	-	-	-	-	-	-	18	1 ²	241 12
Stow, . . .	-	-	42	-	-	-	-	-	-	18	-	-	131 31
Southbridge, . . .	-	11	35	-	-	-	-	-	-	-	-	-	116 45
Sudbury, . . .	-	-	40	-	-	-	-	-	-	-	-	-	250 00
Sunderland, . . .	-	-	-	-	-	-	-	-	-	-	-	4	24 00
Sutton, . . .	-	50	50	24	-	-	-	-	32	24	-	1	188 46
Tewksbury, . . .	2	-	24	-	2	-	-	-	-	30	-	1 ¹	174 00
Tolland, . . .	2	-	-	12	6	-	12	6	-	-	4	-	43 26
Townsend, . . .	-	-	46	-	-	-	-	-	-	-	-	-	250 00
Tyngsborough, . . .	-	220	20	-	-	-	-	54	12	24	36	-	250 00
Tyringham, . . .	2	10	30	-	2	-	10	-	2	3	-	1 ²	144 80
Upton, . . .	1	18	30	-	-	-	-	-	-	-	24	1 ¹	240 23
Wales, . . .	2	-	40	12	2	2	2	-	-	6	-	1 ¹	241 99
Warwick, . . .	-	6	10	-	-	-	-	-	-	-	-	1 ¹	154 35
Washington, . . .	-	-	15	3	1	-	10	-	-	8	-	1 ¹	105 32
Wendell, . . .	-	38	27	-	2	-	12	-	-	18	-	1 ¹	163 24
West Boylston, . . .	-	-	107	-	-	-	-	-	-	-	-	-	250 00
West Bridgewater, . . .	-	-	20	-	-	-	-	-	-	-	-	1 ¹	250 00
West Brookfield, . . .	-	16	49	-	-	-	-	7	-	12	24	-	221 50
West Newbury, . . .	-	8	13	-	-	-	-	3	-	-	18	-	87 12
Westhampton, . . .	-	-	16	-	-	-	-	-	-	-	-	-	48 00
Westminster, . . .	-	77	48	24	-	-	24	1	-	36	12	-	250 00
Whately, . . .	-	-	-	-	-	-	-	4	-	-	12	-	20 75
Wilbraham, . . .	-	27	32	-	-	-	23	4	12	6	12	-	118 38
Wilmington, . . .	-	12	40	-	1	-	-	18	-	34	-	-	187 38
Windsor, . . .	-	-	60	-	-	-	-	-	-	-	-	-	250 00
Worthington, . . .	2	15	10	-	-	3	-	-	-	5	-	1 ¹	86 01
Wrentham, . . .	-	12	30	-	-	4	-	-	-	-	-	1 ¹	250 00
Totals, . . .	114	1,910	3,602	179	61	42	474	210	151	868	647	70	\$20,575 32

¹ One-horse.² Two-horse.

FOREST FIRES OF 1917.

MONTHS.	Number.	Acres.	Cost to extinguish.	Damage.
1916.				
December,	16	200	\$102	\$10
1917.				
January,	53	243	300	35
February,	14	35	—	47
March,	126	379	420	85
April,	824	7,516	5,819	12,639
May,	518	7,283	6,068	16,088
June,	56	406	469	630
July,	46	119	171	2,145
August,	65	294	1,308	3,675
September,	23	29	223	65
October,	20	39	237	50
November,	414	3,477	2,916	5,640
Totals,	2,175	20,020	\$18,033	\$41,109

CLASSIFIED CAUSES OF FOREST FIRES FOR THE PAST FIVE YEARS.

CAUSES.	1912.		1913.		1914.		1915.		1916.		1917.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Unknown,	649	35.1	650	24.2	1,174	37.0	1,134	37.7	301	30.8	634	29.2
Railroad,	640	34.6	913	34.0	830	36.0	777	25.8	412	42.1	800	36.8
Burning brush,	93	5.0	148	5.5	196	6.2	439	14.5	79	8.1	262	12.0
Hunters (smokers),	223	12.0	386	14.3	520	16.4	129	4.2	111	11.3	224	10.3
Steam sawmills,	8	.4	6	.2	3	.1	5	.1	2	.2	5	.2
Children,	79	4.3	109	4.1	140	4.4	161	5.3	35	3.6	133	6.1
Miscellaneous,	159	8.6	476	17.7	318	9.9	363	12.4	38	3.9	117	5.4
Totals,	1,851	100.0	2,688	100.0	3,181	100.0	3,008	100.0	978	100.0	2,175	100.0

TYPES OF LAND BURNED OVER (ACRES).

	1914.	1915.	1916.	1917.
Timber,	3,001	3,817	1,435	1,237
Second growth,	9,016	6,749	755	2,274
Second growth, not merchantable,	7,943	9,107	1,970	4,137
Brush land,	11,645	14,681	9,990	7,126
Grass land,	3,510	8,129	1,573	3,814
Not classified,	4,800	5,907	475	1,432
Totals,	38,975	48,339	16,198	20,020

TYPES OF CLASSIFIED DAMAGES.

	1914.	1915.	1916.	1917.
Standing trees,	\$50,697	\$73,782	\$18,786	\$24,705
Logs, lumber, cordwood,	4,427	23,544	4,545	4,680
Buildings, bogs, etc.,	3,530	31,904	10,823	6,893
Bridges, fences,	331	1,930	1,638	687
Not classified,	26,404	9,907	8,973	4,144
Totals,	\$95,389	\$141,073	\$44,765	\$41,109

COMPARATIVE DAMAGES BY FOREST FIRES FOR THE PAST EIGHT YEARS.

YEAR.	Number of Fires.	Acreage burned.	Cost to extinguish.	Damage.	Average Acreage per Fire.	Average Damage per Fire.
1910,	1,385	42,221	\$23,475	\$205,383	30.46	\$148 29
1911,	2,356	99,693	47,093	537,749	39.31	226 24
1912,	1,851	22,072	20,219	80,834	11.92	43 67
1913,	2,688	53,826	35,456	178,357	20.02	66 35
1914,	3,181	38,975	48,750	95,389	12.25	29 98
1915,	3,008	48,389	36,783	141,073	16.08	46 90
1916,	1,225	16,198	8,593	44,765	13.22	36 54
1917,	2,175	20,020	18,033	41,109	9.21	18 90

FIRES REPORTED FROM OBSERVATION STATIONS.

[The asterisk (*) signifies station not in operation.]

No.	STATIONS.	1914.	1915.	1916.	1917.
1	Harwich station,	35	31	20	22
2	Barnstable station,	14	42	7	10
3	Falmouth station,	1	13	9	7
4	Bourne station,	54	114	28	18
5	Kingston station,	116	102	25	36
6	Waltham station,	*	*	*	2
7	Middleborough station,	133	128	61	25
8	Fall River station,	33	453	222	151
9	Rehoboth station,	105	101	148	79
10	Hanson station,	68	167	68	39
11	Hingham station,	*	*	*	24
12	Sharon station,	203	280	42	72
13	Sudbury station,	*	98	97	77
14	Wakefield station,	174	263	40	35
15	Chelmsford station,	302	276	29	71
16	Georgetown station,	*	213	26	30
17	Manchester station,	96	272	3	4
18	Mendon station,	*	*	65	63
19	Westborough station,	386	530	74	74
20	Wachusett station,	485	598	121	184
21	Petersham station,	*	*	*	*
22	Watatic station,	*	*	*	*
23	Warwick station,	94	36	38	37
24	Pelham station,	47	59	15	24
25	Brimfield station,	90	86	30	41
26	Charlton station,	*	*	*	*
27	Mount Tom station,	135	72	*	37
28	Shelburne Falls station,	130	104	38	34
29	Savoy station,	11	13	1	5
30	West Brookfield station,	*	*	*	*
31	Chester station,	*	*	2	1
32	Tolland station,	*	*	13	14
33	Mount Everett station,	*	3	32	22
34	Lenox station,	*	*	11	21
35	Williamstown station,	*	56	8	-
36	Martha's Vineyard station,	*	*	*	-

PRECIPITATION IN INCHES FROM 1911 TO 1917, INCLUSIVE.

	1911.	1912.	1913.	1914.	1915.	1916.	1917.	Normal.
December, . . .	3.24	2.59	5.73	3.66	4.56	5.69	3.71	3.74
January, . . .	3.07	3.87	3.21	4.30	7.38	1.84	3.32	4.12
February, . . .	3.20	2.24	3.77	3.52	4.30	5.37	3.15	3.97
March, . . .	3.27	5.26	5.32	4.20	.06	4.16	5.03	4.34
April, . . .	2.86	4.05	4.73	5.51	2.44	5.43	3.18	3.46
May, . . .	.89	4.03	2.85	2.95	2.01	3.97	5.86	3.37
June, . . .	4.76	.53	3.20	1.75	1.43	5.31	4.77	3.07
July, . . .	4.55	4.16	2.00	3.38	9.52	7.55	.85	3.65
August, . . .	6.70	3.85	3.30	4.59	4.83	2.81	8.58	3.70
September, . .	3.36	1.71	2.77	.45	.74	1.66	3.17	4.36
October, . . .	3.01	1.52	7.62	2.03	3.11	1.81	6.88	4.13
November, . .	5.71	3.45	2.70	3.06	2.47	1.88	.63	3.96
Totals, . . .	44.62	37.26	47.20	39.40	42.85	47.48	49.13	45.87

APPROPRIATION FOR PREVENTION OF FOREST FIRES.

Appropriation for 1917, \$28,000 00

Receipts:—

For equipment from towns and cities, 1,899 41

For fire towers:—

Auburn, 100 00

Bridgewater, 100 00

Charlton, 100 00

Douglas, 100 00

Dudley, 100 00

Edgartown, 200 00

Groton, 100 00

Lexington, 200 00

Middleborough, 150 00

Millbury, 100 00

Newton, 200 00

Oxford, 100 00

Scituate, 150 00

Southbridge, 100 00

Spencer, 100 00

Sturbridge, 100 00

Sutton, 100 00

Tisbury, 200 00

Uxbridge, 75 00

Waltham, 300 00

Wellesley, 200 00

Mr. and Mrs. Edmund Bridge, 25 00

Mr. William M. Butler, 25 00

Mr. Francis A. Foster, 25 00

Seven Gates Farm, 25 00

Adams Express Company,	\$6 00
Boston & Albany Railroad,	14 92
Boston & Maine Railroad,	22 32
New York, New Haven & Hartford Railroad,	6 74
Paul D. Kneeland,	52 00
New England Telephone and Telegraph Company,	4 61
Mill units to England,	381 59
New Hampshire,	80 00
Rhode Island,	8 00
Rebate on salary increase,	227 52

\$33,678 11

Expenditures:—

Pay roll,	\$16,267 72
Traveling expenses,	4,895 75
Printing,	793 02
Stationery and postage,	132 87
Sundries,	94 76
Equipment,	1,704 60
Construction,	5,597 59
Teams, freight and express,	225 94
Telephone,	737 83
Supplies,	5 80
Town supplies,	2,770 05
Truck expenses,	321 22
Rent,	130 00

\$33,677 15

Balance returned to treasury,	96
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\$33,678 11

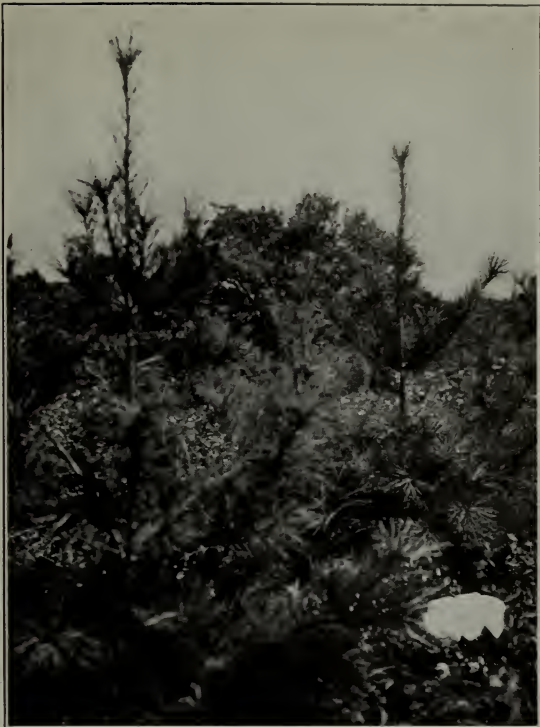
Reimbursement for forest fire-fighting equipment to towns,	\$479 91
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RAILROAD FIRES.

Our reports on file show that we have had 800 railroad fires, as follows: Boston & Albany, 227; Boston & Maine, 129; New York, New Haven & Hartford, 398; and Central Vermont, 46. These fires burned over an area of 7,950 acres, with a damage of \$13,185 and cost to extinguish of \$5,800.

The number of railroad fires has increased considerably over last year. The railroad officials claim that this is due in a measure to defective coal that they have been obliged to use this season. This is undoubtedly true in many instances, but just what percentage of these fires was due to this cause I am unable to state. Our inspectors' reports of locomotives examined by them show many minor defects, but very few serious defects on locomotives that were used entirely within the State.

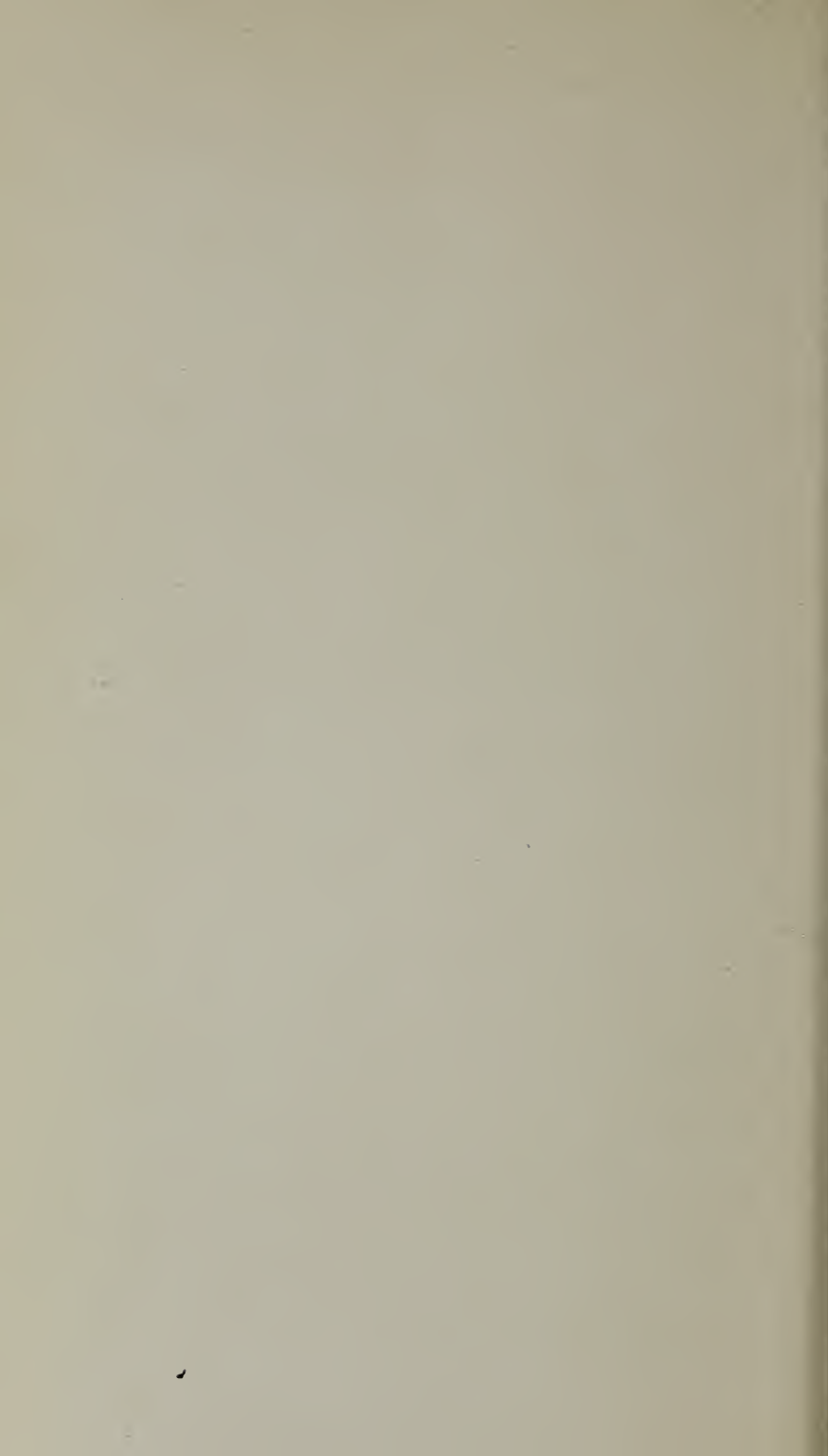
Owing to the shortage of labor and the high wages paid in practically all industries throughout the State, many towns have experienced considerable difficulty in securing men for fighting forest fires. This is especially true in the case of railroad fires, as the railroads are at present paying only 25 cents per hour for this work. It seems very evident that



This photograph was taken in the 80-acre plantation on Nantucket. It represents a growth of 29 inches the past season. These trees were four-year-old white pine transplants when set, and the whole plantation thus far is a pronounced success. The average growth of the plantation this season is over 8 inches. Two-year-old Scotch pine seedlings set at the same time have not done as well. This experiment is in co-operation with the Nantucket Civic League.



This photograph was taken in September, and shows dry dead grass standing along a trolley line. Is there any wonder that forest fires develop here? Never-go-out matches, cigarette and cigar stubs are constantly being thrown from electric cars. Here are ideal conditions for a conflagration, and it is almost a miracle if fires do not result. In fact, they do, and



this rate must be increased to at least 35 or 40 cents per hour for laborers, and 50 cents per hour for wardens, if we are to secure the labor necessary for handling this class of fires in the future.

During the past years we have had considerable trouble with the Central Vermont locomotives, owing to the terminals being in Vermont and Connecticut, but this season the Massachusetts Public Service Commission has required that a report be filed with them each month showing the actual condition of the front ends and ash pans of the locomotives running through this State. Our inspectors have inspected 1,249 locomotives, as follows: Boston & Albany, 167, of which 63 were defective; Boston & Maine, 346, of which 34 were defective; New York, New Haven & Hartford, 736, of which 211 were defective.

The following reports from Mr. E. A. Ryder, commissioner of the Boston & Maine Railroad, and Mr. Charles B. Rood, general fire claim agent of the New York, New Haven & Hartford Railroad, will give you a general idea of what these roads have done during the past year relative to fire protection.

BOSTON, MASS., Dec. 14, 1917.

MR. M. C. HUTCHINS, *State Fire Warden, State House, Boston, Mass.*

DEAR SIR:— Acknowledging your letter of the 5th instant, relative to report covering fire prevention work for the current year, we beg to state that during the eleven months we have had 940 fires from sparks from locomotives.

During November we had 272 fires, which is the greatest number we have had in that month since taking hold of this work in 1912.

Practically all of this year our section crews have been lacking the usual number of men, so that it has been difficult to attempt more than the necessary track work; and in some cases we could not even man our patrol cars. This of course delayed and in many cases prevented the cutting of the grass and burning the right of way. It should also be borne in mind that in many places the hay crop was not harvested, so that the rain during the first three weeks of October so matted the grass that it left "comfy" places for sparks; and to make matters worse, we had neither rain nor snow the first twenty days of the month, but did have almost daily high winds, — a very unusual condition.

For the eleven months we have paid, in fire claims, \$20,045.40, and for outside help in fighting fires, \$1,652.03, compared with \$35,884.51 and \$4,335.64, respectively, for 1916.

During the period we have received forty-two permissions to burn grass and slash on property contiguous to our right of way, and we have written many individuals and firms requesting that they remove fire hazards.

Six hundred and twenty-one locomotives reported as setting fires have received special examination.

Yours truly,

E. A. RYDER,
Commissioner.

BOSTON, MASS., Dec. 21, 1917.

MR. M. C. HUTCHINS, *State Fire Warden, State House, Boston, Mass.*

DEAR SIR:— Complying with your request of Dec. 5, 1917, relative to the activities of this department in cleaning up right of way, etc., beg to advise that during the past year, commencing Jan. 1, 1917, we have cleared up approximately 500 miles of right of way and adjacent property, cutting the underbrush and

trimming trees for fire protection, at a total cost of \$6,132.49. Practically the entire length of right of way in the State of Massachusetts has been burned over, with the exception of certain places where it has been too damp to burn up to the present time. This is also true of many parcels adjoining our right of way where permits to burn could be obtained, and where it was not necessary to cut any brush or undergrowth.

Since Jan. 1, 1917, up to and including this date, we have received 121 claims from property owners in the State of Massachusetts, of which 84 claims have been settled for a total of \$9,775.59, leaving a balance of 37 unsettled claims, all of which, however, are for slight damages.

We have paid \$338.77 to various towns in the State of Massachusetts for services in extinguishing fires during the above period, of which amount \$182.11 was paid to towns on the Cape.

Regarding the matter of patrol work, would say that it has long been our custom, during the dry seasons each year, to place patrolmen on practically every dangerous section of the line, whose duty it is to follow up all trains as closely as possible and watch for fires.

Yours very truly,

C. B. Rood,

General Fire Claim Agent.

FEDERAL CO-OPERATION.

We have maintained the same co-operative arrangement with the United States Forest Service this year as in former years, the allotment allowed the Commonwealth of Massachusetts being \$2,752 for payment of observers, and \$500 for construction work. As the regulations governing the Federal allotment required that the observers and men on construction work be paid direct by the Federal department, it was necessary to transfer nine observers to the Federal pay roll for the entire season, and five men for a period covering the time the construction appropriation lasted. The aid received from the Federal department has certainly been of great assistance to this department, allowing us to expend a portion of our State appropriation for the construction of observation towers. Our allotment for the coming season will undoubtedly remain the same, with the exception of the construction appropriation.

During the season Mr. Louis S. Murphy, acting chief of State Co-operation of the Federal Forest Service, visited several of the Massachusetts stations maintained by that department.

Of the \$2,000 appropriated by the General Court for reimbursing towns with a valuation of \$1,750,000 or less, 50 per cent. on forest fire-fighting equipment purchased by them and approved by this department, but \$479.91 has been expended. This is the lowest expenditure from this appropriation in several years, and is probably due to the favorable fire season and also to the fact that many of the reimbursement towns have already taken up their entire allotment.

Respectfully submitted,

M. C. HUTCHINS,
State Fire Warden.

STATE HIGHWAY WORK.

Along the State highways spraying and cleaning for the gypsy and brown-tail moths and the elm-leaf beetle were done under the direction of this department. A list of the towns and cities in which the work was done may be found in the report of the State Highway Commission. The expenditure amounted to \$10,000.

CO-OPERATIVE MOTH WORK.

Co-operative moth work has been carried on this past year as heretofore on the North Shore. Spraying was done in Dover last year, but very little other co-operative work has been done. The financial condition of the funds is as follows: —

Special North Shore Fund.

Balance Nov. 30, 1916,	\$3,381 46	
Receipts: —		
Wm. D. Sohier, agent for property owners,	2,456 64	
F. W. Rane, State Forester,	6,000 00	
Wm. D. Sohier, agent,	6,000 00	
City of Beverly,	3,000 00	
Town of Manchester,	3,000 00	
Massachusetts Highway Commission,	631 70	
Massachusetts Highway Commission (mosquito work),	346 71	
Sale of truck,	200 00	
Sale of water carts,	300 00	
Sale of empty barrels,	16 10	
Appropriation for suppression of gypsy and brown-tail moths,	1,701 42	
Wm. D. Sohier, for property owners,	1,961 70	
Wm. D. Sohier, agent,	1,000 00	
F. W. Rane, State Forester,	1,000 00	
	<hr/>	\$30,995 73
Expenditures: —		
Pay roll,	\$15,832 09	
Travel,	729 89	
Supplies,	11,301 03	
Sundries,	1,222 35	
Rent of store,	375 00	
	<hr/>	29,460 36
Balance, Nov. 30, 1917,		\$1,535 37

Dover Gypsy Moth Fund.

Balance, Nov. 30, 1916,	\$471 35	
Receipts:—		
For wood sold,	334 88	
For spraying,	1,383 45	
	<hr/>	\$2,189 68
Expenditures:—		
Pay roll,	\$96 59	
Supplies,	1,971 45	
Sundries,	13 00	
	<hr/>	2,081 04
		<hr/>
Balance, Nov. 30, 1917,		\$108 64

Sagamore Gypsy Moth Fund.

Balance, Nov. 30, 1916,	\$329 73
Receipts:—	
Spraying (1916),	243 85
	<hr/>
Balance, Nov. 30, 1917,	\$573 58

FINANCIAL STATEMENT.

Office Salaries.

Appropriation for 1917,	\$6,900 00
Expenditures,	6,291 50
	<hr/>
Balance returned to treasury Nov. 30, 1917,	\$608 50

Office Incidentals.

Appropriation for 1917,	\$5,100 00
Expenditures:—	
Travel,	\$1,506 98
Printing,	826 40
Stationery and postage,	1,390 37
Supplies,	100 70
Maps, photos, etc.,	290 88
Educational work,	58 74
Sundries,	400 10
	<hr/>
	4,574 17
	<hr/>
Balance returned to treasury Nov. 30, 1917,	\$525 83

THE DISTRIBUTION OF SUPPLIES.

The following is a list of cities and towns, with amount of supplies for moth work furnished them, for the year ending Nov. 30, 1917. The amounts given are the gross amounts furnished, some of the cities and towns having made payments to the State Forester's office for all or a part of the amounts, according to their net expenditures or their class under the provisions of the law. For amounts received from this office in reimbursement and supplies see the table on page 73.

LIST OF CITIES AND TOWNS AND AMOUNTS OF SUPPLIES FURNISHED FOR 1917.

Acton,	\$861 35	Eastham,	\$3 73
Andover,	1,586 70	Easthampton,	40 75
Arlington,	632 50	Essex,	254 44
Ashburnham,	362 76	Foxborough,	163 00
Ashby,	426 94	Franklin,	81 50
Ashland,	508 19	Gardner,	97 80
Attleboro,	97 80	Georgetown,	648 54
Auburn,	84 90	Gloucester,	446 62
Avon,	124 45	Grafton,	4 23
Ayer,	340 27	Groton,	913 68
Barnstable,	6 32	Groveland,	1,082 96 ¹
Bedford,	1,139 23	Halifax,	250 10
Berkley,	488 93 ¹	Hamilton,	986 96
Berlin,	489 37	Hanover,	918 74
Beverly,	545 55	Hanson,	304 06
Billerica,	1,398 26	Harvard,	1,054 19
Bolton,	753 97	Harwich,	254 13
Boxborough,	692 97	Hingham,	1,422 00
Boxford,	731 06	Holbrook,	265 29
Boylston,	66 17	Holden,	195 46
Brewster,	78	Holliston,	156 35
Bridgewater,	612 76	Hopkinton,	142 06
Burlington,	614 99	Hudson,	562 80
Cambridge,	308 10	Ipswich,	1,134 02
Canton,	2,295 95	Kingston,	12 36
Carlisle,	586 26	Lakeville,	199 95
Carver,	275 27	Lancaster,	203 75
Chelmsford,	1,384 67	Lexington,	1,805 03
Cohasset,	2,125 60	Lincoln,	2,591 89 ¹
Concord,	692 98	Littleton,	1,033 00
Danvers,	1,036 14	Lowell,	845 26
Dracut,	1,251 11	Lunenburg,	1,056 11
Dunstable,	508 80	Lynnfield,	1,013 35
Duxbury,	1,182 72	Malden,	809 74 ¹
East Bridgewater,	1 50	Manchester,	359 51

¹ This amount includes cost of sprayer.

LIST OF CITIES AND TOWNS AND AMOUNTS OF SUPPLIES FURNISHED FOR
1917 — *Concluded.*

Mansfield,	\$11 14	Saugus,	\$810 27
Marblehead,	158 50	Scituate,	1,352 95
Marlborough,	1,105 47	Sharon,	1,740 69 ¹
Marshfield,	1,260 73	Sherborn,	889 36
Mashpee,	537 21	Shirley,	562 80
Medfield,	666 85	Shrewsbury,	293 30
Medford,	79 25	Southborough,	548 56
Medway,	122 25	Sterling,	362 49
Merrimac,	1,083 83 ¹	Stoneham,	653 57
Methuen,	1,095 31	Stoughton,	656 16 ¹
Middleborough,	1,587 57	Stow,	841 80
Middleton,	1,255 04 ¹	Sudbury,	1,009 45
Millbury,	25 41	Sutton,	163 25
Millis,	418 23	Taunton,	163 00
Milton,	3,496 35	Templeton,	159 83
Nantucket,	20 00	Tewksbury,	1,268 84
Natick,	233 49	Tisbury,	75 50
Needham,	1,141 00	Topsfield,	632 06
Newbury,	989 51	Townsend,	849 92
Newton,	697 60	Tyngsborough,	1,091 94
Norfolk,	187 85	Upton,	3 13
North Andover,	1,055 79	Wakefield,	747 64
North Attleborough,	122 25	Walpole,	420 80
North Reading,	932 92	Waltham,	2,548 97 ¹
Northborough,	977 98	Watertown,	220 05
Norwell,	1,117 71	Wayland,	1,163 56
Norwood,	301 55	Wellesley,	1,684 50
Peabody,	652 00	Wellfleet,	619 06 ¹
Pembroke,	1,490 04	Wenham,	596 71
Pepperell,	691 03	West Boylston,	167 66
Plainville,	81 05	West Bridgewater,	351 87
Plympton,	283 74	West Newbury,	568 15
Prescott,	16 30	Westborough,	402 25
Princeton,	275 41	Westford,	1,059 18
Quincy,	1,264 25	Westminster,	137 96
Raynham,	202 76	Weston,	2,634 12
Reading,	2,210 60	Wilmington,	1,243 02
Rehoboth,	494 44 ¹	Winchendon,	325 91
Revere,	47 40	Winthrop,	81 50
Rochester,	557 41 ¹	Woburn,	861 17
Rockport,	499 50	Worcester,	2,853 50 ¹
Rowley,	1,136 23	Wrentham,	1,735 16 ¹
Salisbury,	566 03		
Sandwich,	521 41		\$111,750 68

¹ This amount includes cost of sprayer.

Dover gypsy moth fund,	\$936 75
State Forest Commission,	119 43
Prevention of forest fires,	59 27
General forestry and nurseries,	245 03
Massachusetts School for Feeble-minded,	1 45
Special North Shore fund,	8,793 53
Purchase and planting of forest lands,	147 64
Lead sold,	114 10
Thinning work,	445 78
Bird houses,	154 53
Traveling sprayer,	475 96
	<hr/>
	\$11,493 47

APPROPRIATION FOR SUPPRESSION OF GYPSY AND BROWN-TAIL MOTHS.

FINANCIAL STATEMENT.

Balance on hand, Nov. 30, 1916,	\$78,367 55
Less reimbursement paid for 1916,	25,213 07
	<hr/>
Balance for 1917 work,	\$53,154 48

Receipts.

Acton,	\$48 64
Andover,	820 20
Arlington,	632 50
Attleboro,	97 80
Auburn,	75 52
Ayer,	1,151 87
Barnstable,	21 06
Berkley,	31 25
Beverly,	545 55
Billerica,	301 08
Boxford,	100 25
Boylston,	491 35
Brewster,	78
Cambridge,	308 10
Canton,	595 85
Cohasset,	2,125 60
Concord,	1,160 79
Danvers,	152 37
Eastham,	3 73
Easthampton,	40 75
Essex,	720 28
Foxborough,	163 00
Franklin,	281 36
Gardner,	97 80

<i>Amounts carried forward,</i>	<hr/>	<hr/>
	\$9,967 48	\$53,154 48

<i>Amounts brought forward,</i>	.	.	.	.	\$9,967 48	\$53,154 48
Gloucester,	.	.	.	.	1,181 60	
Grafton,	.	.	.	.	6 06	
Groton,	.	.	.	.	267 16	
Hamilton,	.	.	.	.	431 55	
Hingham,	.	.	.	.	1,422 00	
Holden,	.	.	.	.	1,044 93	
Holliston,	.	.	.	.	157 13	
Hopkinton,	.	.	.	.	857 36	
Ipswich,	.	.	.	.	67 02	
Lakeville,	.	.	.	.	564 23	
Lancaster,	.	.	.	.	203 75	
Lincoln,	.	.	.	.	137 05	
Lowell,	.	.	.	.	1,392 69	
Lynnfield,	.	.	.	.	1,361 58	
Manchester,	.	.	.	.	316 25	
Marblehead,	.	.	.	.	158 50	
Marlborough,	.	.	.	.	358 69	
Medfield,	.	.	.	.	1,052 19	
Medford,	.	.	.	.	79 25	
Medway,	.	.	.	.	122 25	
Methuen,	.	.	.	.	49 98	
Millbury,	.	.	.	.	26 14	
Millis,	.	.	.	.	370 83	
Milton,	.	.	.	.	1,882 00	
Nantucket,	.	.	.	.	20 00	
Natick,	.	.	.	.	83 75	
Needham,	.	.	.	.	2,838 55	
Newton,	.	.	.	.	5,983 41	
North Andover,	.	.	.	.	287 33	
North Attleborough,	.	.	.	.	123 50	
Norwood,	.	.	.	.	301 55	
Peabody,	.	.	.	.	652 00	
Plainville,	.	.	.	.	66 33	
Prescott,	.	.	.	.	16 30	
Princeton,	.	.	.	.	751 55	
Quincy,	.	.	.	.	1,865 71	
Raynham,	.	.	.	.	5 92	
Rehoboth,	.	.	.	.	4 08	
Revere,	.	.	.	.	47 40	
Rockport,	.	.	.	.	499 50	
Rowley,	.	.	.	.	4 22	
Sandwich,	.	.	.	.	675 00	
Saugus,	.	.	.	.	184 36	
<hr/>						
<i>Amounts carried forward,</i>	.	.	.	.	\$37,888 13	\$53,154 48

Amounts brought forward, \$37,888 13 \$53,154 48

Sharon,	211 90
Sherborn,	421 05
Shirley,	6 66
Somerset,	64 00
Sterling,	45 06
Stoneham,	191 30
Stoughton,	38 81
Sutton,	163 96
Taunton,	163 00
Templeton,	1,428 34
Tisbury,	75 50
Topsfield,	2,479 83
Truro,	31 52
Wakefield,	777 63
Walpole,	326 00
Waltham,	4,160 17
Watertown,	220 05
Wellesley,	1,684 50
Wellfleet,	2 11
Wenham,	41 10
West Boylston,	718 71
West Newbury,	19 02
Weston,	723 49
Winchendon,	2,026 75
Winthrop,	81 50
Woburn,	1 20
Worcester,	2,285 67
Gardner State Colony,	6 39
Massachusetts School for Feeble-minded,	1 45
Massachusetts Highway Commission,	2,722 18
Levi H. Greenwood,	81 50
Fitzhenry-Guptill Company,	24 45
E. S. Jenness,	6 40
R. S. Langdell,	8 15
Paul D. Kneeland (expenses),	7 24
Paul D. Kneeland, agent (thinning work),	1,535 00
For bird houses,	157 23
For barrels sold,	21 13
For gasoline sold,	2 60
For old tires sold,	2 40
Rebate from Wells, Fargo & Co.,	25
Checks returned from Northborough,	11 75
Checks returned from Duxbury,	61 45

Amounts carried forward, \$60,926 53 \$53,154 48

Amounts brought forward, \$60,926 53 \$53,154 48

Transfers for supplies: —

General forestry and nurseries,	387 76	
Purchase and planting of forest lands, . .	147 64	
Special North Shore fund,	8,991 53	
Dover Gypsy Moth fund,	1,932 60	
State Forest Commission,	4 23	
Appropriation for investigation and suppression of white pine blister rust,	1,446 07	
	<hr/>	73,836 36
		\$126,990 84
Appropriation of 1917,		165,000 00
		<hr/>
		\$291,990 84

Expenditures.

Pay roll,	\$19,078 44	
Travel,	8,886 77	
Supplies,	148,119 18	
Rent of store,	300 00	
Storehouse equipment,	187 80	
Special work,	7,000 00	
Town pay rolls,	29,849 81	
Reimbursements,	15,974 43	
Thinning work,	303 53	
Printing,	94 86	
Stationery and postage,	85 32	
Experts,	26 10	
Sundries,	918 33	
	<hr/>	230,824 57
Balance Nov. 30, 1917,		\$61,166 27

FINANCIAL SUMMARY OF MOTH WORK BY TOWNS.

In the following table we show the expenditures in detail for the year 1917. We also have indicated in the second and third columns of figures the amount received by each town or city for the years previous to and including 1917, — in the first column, the amounts received in the years 1905 to 1909, inclusive, and in the second column the amounts received for the years 1910 to 1917, inclusive. The last group of years covers the period since the establishment of our storehouse, during which we have furnished supplies to various towns and cities. The amounts given in supplies are included in the totals.

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.						1918.
		1905 to 1909, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Abington,	3	\$2,289 72	-	\$1,498 09	-	{ \$589 44 ¹ 75 90 }	-	-	-	\$1,472 36
Acton,	3	6,507 90	\$9,974 52	1,007 59	\$1,113 76	-	\$106 17	\$861 35	\$967 52	827 15
Acushnet,	3	-	-	516 42	-	-	-	-	-	609 16
Amesbury,	2	378 10	-	2,910 97	-	-	-	-	-	2,840 50
Andover,	2	6,431 29	8,967 09	3,570 38	3,938 47	1,670 84	-	1,586 70	1,563 83	3,126 90
Arlington,	1	32,589 84	4,343 41	5,000 00	-	-	-	632 50	-	5,000 00
Ashburnham,	3	-	3,351 16	503 74	1,066 99	79 25	563 25	362 76	926 01	528 33
Ashby,	3	-	3,309 52	319 16	812 52	305 36 ¹	493 36	426 94	920 30	272 16
Ashland,	3	716 70	2,441 14	639 81	498 56	182 45	-	508 19	434 94	637 91
Athol,	2	-	-	2,708 91	-	-	-	-	-	2,833 00
Attleboro,	1	-	-	5,000 00	-	-	-	97 80	-	5,000 00
Auburn,	3	-	131 80	735 02	-	-	-	84 90	-	802 25
Avon,	3	-	1,646 87	467 46	518 48	24 40	51 02	124 45	175 47	480 95
Ayer,	3	-	1,992 49	998 17	562 77	29 75	-	340 27	12 62	984 06
Barnstable,	2	-	2,388 43	3,721 72	-	-	-	6 32	-	3,239 86

¹ Arsenate of lead sold.

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.						1918.
		1905 to 1909, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Barre,	3	-	-	\$1,137 36	-	{	-	-	-	\$1,167 38
Bedford,	3	\$22,022 24	\$23,940 12	856 03	\$1,343 21	{ \$111 80 ¹ 933 22	\$487 18	\$1,139 23	\$1,626 41	773 75
Bellingham,	3	-	-	443 66	-	-	-	-	-	461 15
Belmont,	1-2	10,183 53	584 34	5,000 00	-	-	-	-	-	4,718 18
Berkley,	3	-	738 57	238 32	230 84	82 49	-	488 93	362 45	245 02
Berlin,	3	888 65	7,443 59	269 80	685 51	{ 110 65 ¹ 114 09	415 71	489 37	905 08	256 88
Beverly,	1	5,189 97	666 02	5,000 00	-	-	-	545 55	-	5,000 00
Billerica,	3-2	14,746 70	11,487 39	2,312 06	1,948 19	{ 409 41 ¹ 318 43	-	1,398 26	1,034 39	2,429 99
Blackstone,	3	-	-	1,004 08	-	-	-	-	-	595 51
Bolton,	3	1,320 10	7,729 60	438 01	435 05	{ 303 59 ¹ 122 75	-	753 97	751 01	312 86
Boston,	1	28,956 26	86,774 69	5,000 00	-	-	-	-	-	5,000 00
Bourne,	2-3	2,280 62	-	3,112 44	-	-	-	-	-	2,305 92
Boxborough,	3	4,160 18	13,279 83	122 74	888 66	{ 513 09 ¹ 114 91	765 92	692 97	1,458 89	124 72
Boxford,	3	7,068 76	14,563 00	579 56	1,217 79	{ 374 02 ¹ 179 00	638 23	731 06	1,369 29	370 73
Boylston,	3	-	3,001 25	234 29	938 50	158 43	704 21	66 17	770 38	232 98
Braintree,	2	1,445 27	1,535 76	3,989 75	-	-	-	-	-	3,707 81
Brewster,	3	-	-	419 79	-	-	-	78	-	397 57

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.						1918.
		1905 to 1909, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Deerfield,	3	-	-	\$1,101 23	-	-	-	-	-	\$1,360 46
Dennis,	3	-	-	620 02	-	-	-	-	-	509 13
Dighton,	3	-	-	754 02	-	-	-	-	-	860 61
Douglas,	3	-	-	764 57	-	-	-	-	-	568 38
Dover,	2-3	\$6,460 75	\$1,054 85	3,652 23	-	-	-	-	-	1,000 71
Draut,	3	4,077 88	9,798 79	1,060 90	\$1,529 00	\$728 50	\$468 00	\$1,251 11	\$1,719 11	1,095 00
Dudley,	3	-	-	1,008 86	-	-	-	-	-	969 54
Dunstable,	3	2,181 31	9,410 46	284 99	934 31	342 33	640 32	508 80	1,158 12	144 52
Duxbury,	3	5,147 30	-	1,426 07	2,608 10	1,000 03	1,182 03	1,182 72	2,364 75	1,268 17
East Bridgewater,	3	5,600 72	2,414 16	1,169 82	-	-	-	1 50	-	1,307 24
Eastham,	3	-	-	187 54	-	-	-	3 73	-	175 82
Easthampton,	2	-	-	3,217 03	110 24	-	-	40 75	-	3,925 74
Easton,	2-3	-	1,058 40	3,049 75	-	-	-	-	-	1,618 75
Edgartown,	3	-	-	610 35	-	-	-	-	-	635 11
Essex,	3	7,041 13	5,363 69	538 51	703 09	386 25	164 58	254 44	419 02	518 83
Everett,	1	-	-	5,000 00	-	-	-	-	-	5,000 00
Fairhaven,	3	-	-	1,978 57	-	-	-	-	-	2,250 83

Fall River,	.	.	.	.	.	1	5,000 00	-	-	-	-	-	-	5,000 00
Falmouth,	.	.	.	.	2 20	1-2	5,000 00	-	-	-	-	-	-	2,774 32
Fitchburg,	.	.	.	.	6 73	1	5,000 00	-	-	-	-	-	-	5,000 00
Foxborough,	.	.	.	.	-	3	1,134 26	-	-	-	-	-	-	1,146 04
Framingham,	.	.	.	.	1,161 04	1	5,000 00	-	-	-	-	-	-	5,000 00
Franklin, .	.	.	.	.	-	3	2,391 85	160 00	-	-	81 50	-	-	2,155 79
Freetown,	.	.	.	.	-	3	455 91	-	-	-	-	-	-	474 24
Gardner, .	.	.	.	.	-	2	4,765 91	-	-	-	-	-	-	4,296 30
Georgetown,	.	.	.	.	12,472 67	3	550 15	820 54	{	50 40 ¹ 638 77	270 39	648 54	918 93	533 93
Gloucester,	.	.	.	.	-	1	5,000 00	2,547 09		631 14	-	446 62	-	5,000 00
Grafton, .	.	.	.	.	-	3	1,532 05	700 52		185 00	-	4 23	-	1,334 07
Great Barrington,	.	.	.	.	72	2	3,533 27	-	-	-	-	-	-	3,469 34
Greenfield,	.	.	.	.	2 01	1	5,000 00	-	-	-	-	-	-	5,000 00
Groton, .	.	.	.	.	6,777 81	3	2,037 92	-	-	-	-	-	-	1,124 62
Groveland,	.	.	.	.	7,250 30	3	566 94	804 93	{	66 77 ¹ 322 24	237 99	1,082 96	1,320 95	577 09
Halifax, .	.	.	.	.	4,739 17	3	297 00	1,022 55		282 24	725 55	250 10	975 65	295 75
Hamilton,	.	.	.	.	9,451 28	2-3	2,948 14	2,823 69		1,410 37	-	989 96	680 01	1,471 49
Hanover, .	.	.	.	.	11,401 06	3	953 27	1,817 50		380 81	864 23	918 74	1,782 97	725 05
Hanson, .	.	.	.	.	6,331 24	3	675 21	725 45	{	28 32 ¹ 639 35	50 24	304 06	354 30	808 13
Harvard, .	.	.	.	.	10,718 88	3	888 02	1,554 75	{	647 97 ¹ 403 11	666 73	1,054 19	1,730 92	758 79
Harwich, .	.	.	.	.	797 05	3	748 76	796 09		109 65	47 33	254 13	301 46	759 81
Haverhill,	.	.	.	.	696 72	1	5,000 00	-	-	-	-	-	-	5,000 00

¹ Arsenate of lead sold.

CITIES AND TOWNS.		Class.	TOTAL AMOUNT RE- CEIVED FROM STATE.		1917.						1918.
			1905 to 1909, in- clusive.	1910 to 1917, in- clusive.	Required Expendi- ture.	Total Net Expendi- ture.	Private Work.	Reim- bursement.	Tools supplied.	Total Amount received from State.		Required Expendi- ture.
Hingham,	.	.	\$6 990 52	\$4,452 11	\$3,006 14	-	-	-	\$1,422 00	-	\$2,740 55
Holbrook,	.	.	-	712 66	748 20	\$759 00	{ \$7 00 ¹ 285 14	-	205 29	\$205 29	696 49
Holden,	.	.	-	5,972 03	805 27	2,112 61	326 05	\$1,307 34	195 46	1,502 80	752 17
Holliston,	.	.	-	58	1,289 56	-	-	-	156 35	-	806 59
Hopedale,	.	.	-	-	3,507 84	-	-	-	-	-	1,923 46
Hopkinton,	.	.	1,320 48	1,464 09	795 86	819 67	32 85	23 81	142 06	165 89	751 34
Hubbardston,	.	.	-	169 59	322 27	-	-	-	-	-	326 03
Hudson,	.	.	2,266 68	4,407 88	1,752 91	1,867 36	796 95	-	562 80	562 80	1,750 70
Hull,	.	.	-	-	3,882 18	-	-	-	-	-	4,112 01
Ipswich,	.	.	7,240 22	11,237 13	2,419 40	2,548 33	{ 726 21 ¹ 753 39	-	1,134 02	1,010 36	2,211 59
Kingston,	.	.	1,750 64	8,926 39	697 60	892 03	291 14	194 43	12 36	206 79	638 84
Lakeville,	.	.	-	1,660 22	531 77	670 05	186 59	138 28	199 95	338 23	478 23
Lancaster,	.	.	-	51	2,825 00	-	-	-	203 75	-	957 23
Lawrence,	.	.	-	-	5,000 00	-	-	-	-	-	5,000 00
Leicester,	.	.	-	-	1,019 31	-	-	-	-	-	950 44
Lenox,	.	.	-	72	3,378 92	-	-	-	-	-	2,918 70
Leominster,	.	.	-	1 80	5,000 00	-	-	-	-	-	5,000 00

Lexington,	.	.	.	.	.	37,954 69	23,027 37	4,087 50	3,807 71	1,543 80	-	1,805 03	1,220 19	3,396 08
Leyden, .	.	.	.	.	.	-	-	96 36	-	-	-	-	-	99 09
Lincoln, .	.	.	.	.	.	11,231 98	17,954 34	1,094 02	2,239 30	1,814 35	-	2,591 89	2,437 17	755 21
Littleton,	.	.	.	.	.	3,054 50	8,944 76	529 29	101 55	{ 572 99 ¹ 77 60 }	-	1,033 00	605 26	516 45
Lowell, .	.	.	.	.	.	-	2,235 40	5,000 00	-	-	-	845 26	-	5,000 00
Lunenburg,	.	.	.	.	.	81 34	9,026 69	678 19	1,033 48	{ 197 60 ¹ 995 31 }	355 29	1,056 11	1,411 40	688 27
Lynn, .	.	.	.	.	.	23,169 11	-	5,000 00	-	-	-	-	-	5,000 00
Lynnfield,	.	.	.	.	.	12,922 81	17,397 91	576 85	1,807 77	728 87	1,230 92	1,013 35	2,244 27	603 05
Malden, .	.	.	.	.	.	7,973 93	537 52	5,000 00	-	-	-	809 74	-	5,000 00
Manchester,	.	.	.	.	.	-	-	5,000 00	-	-	-	359 51	-	4,441 58
Mansfield,	.	.	.	.	.	-	-	1,870 49	-	-	-	11 14	-	1,886 67
Marblehead,	.	.	.	.	.	1,299 58	-	4,675 52	-	-	-	158 50	-	4,439 43
Marion, .	.	.	.	.	.	-	-	2,427 97	-	-	-	-	-	1,289 42
Marlborough,	.	.	.	.	.	1,806 21	6,031 64	4,564 27	4,831 20	2,114 68	-	1,105 47	506 32	4,457 76
Marshfield,	.	.	.	.	.	3,384 23	11,293 21	1,122 79	1,593 36	{ 84 63 ¹ 1,253 96 }	470 57	1,260 73	1,731 30	1,038 17
Mashpee, .	.	.	.	.	.	543 82	9,934 41	164 20	1,687 55	1,266 52	1,523 35	537 21	2,060 56	185 57
Mattapoisett,	.	.	.	.	.	-	-	1,081 48	-	-	-	-	-	733 01
Maynard,	.	.	.	.	.	3,277 64	989 44	1,730 40	-	-	-	-	-	1,874 24
Medfield, .	.	.	.	.	.	-	2,014 95	1,007 37	1,426 42	736 99	362 60	666 85	869 45	837 89
Medford, .	.	.	.	.	.	22,858 83	4,208 13	5,000 00	-	-	-	79 25	-	5,000 00
Medway, .	.	.	.	.	.	-	-	747 00	-	-	-	122 25	-	766 34
Melrose, .	.	.	.	.	.	9,558 67	-	5,000 00	-	-	-	-	-	5,000 00

¹ Arsenate of lead sold.

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.						1918.
		1905 to 1909, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Mendon,	3	-	-	\$298 77	-	-	-	-	-	\$298 02
Merrimac,	3	\$3,446 00	\$7,240 96	694 12	\$1,411 18	\$279 75	\$267 06	\$1,083 83 ¹	\$900 89	636 86
Methuen,	2	8,112 94	7,517 02	4,158 82	3,461 72	2,200 81	-	1,095 31	318 57	4,238 23
Middleborough,	3	385 96	19,833 68	2,082 34	5,650 24	1,039 59	3,567 90	1,587 57	5,155 47	1,961 52
Middleton,	3	6,436 23	9,807 36	383 89	1,093 05	{ 75 70 ¹ 521 00 }	259 16	1,255 04	1,064 20	396 36
Milford,	2	-	-	4,222 93	-	-	-	-	-	4,100 52
Millbury,	3	-	-	1,336 42	-	-	-	25 41	-	1,363 30
Millis,	3	-	23 23	622 75	-	-	-	418 23	-	592 77
Millville,	3	-	-	-	-	-	-	-	-	483 05
Milton,	1	-	9,082 33	5,000 00	7,238 44	5,877 19	-	3,496 35	2,228 87	5,000 00
Monson,	3	-	-	809 53	-	-	-	-	-	732 97
Montague,	2	-	-	3,055 50	-	-	-	-	-	3,199 20
Nahant,	2-3	-	-	3,556 01	-	-	-	-	-	1,663 35
Nantucket,	3	-	40	2,241 19	-	-	-	20 00	-	2,145 30
Natick,	2	8,157 83	254 56	3,801 28	5,100 71	{ 438 09 ¹ 399 00 }	-	233 49	-	3,143 58
Needham,	2	4,062 91	1,580 52	3,915 13	-	-	-	1,141 00	-	3,663 50
New Bedford,	1	-	-	5,000 00	-	-	-	-	-	5,000 00

New Brimtree,	3	-	-	172 77	-	-	-	-	-	174 07
New Sulem,	3	-	-	107 56	-	-	-	-	-	107 89
Newbury,	3	12,627 11	15,854 17	714 05	1,127 91	{ 441 85 ¹ 584 59 }	413 26	989 51	1,402 77	595 89
Newburyport,	1-2	-	-	5,000 00	-	-	-	-	-	4,531 57
Newton,	1	13,130 78	42,409 09	5,000 00	-	-	-	697 60	-	5,000 00
Norfolk,	3	-	2,241 11	478 39	640 04	178 30	161 05	187 85	340 50	472 55
North Andover,	2-3	6,283 31	7,575 04	2,452 22	2,500 27	{ 83 45 ¹ 708 08 }	-	1,055 79	887 87	2,159 71
North Attleborough,	2	-	-	3,744 14	-	-	-	122 25	-	3,371 41
North Brookfield,	3	-	-	802 89	-	-	-	-	-	786 56
North Reading,	3	8,394 87	21,919 57	415 60	1,940 14	681 31	1,533 54	932 92	2,466 46	439 46
Northborough,	3	-	6,777 78	838 04	1,140 96	{ 165 60 ¹ 306 36 }	302 32	977 98	1,280 30	777 02
Northbridge,	3	-	-	2,326 80	-	-	-	-	-	2,052 11
Norton,	3	-	-	681 27	-	-	-	-	-	701 16
Norwell,	3	3,818 08	9,872 03	540 92	614 89	921 33	73 97	1,117 71	1,191 08	505 42
Norwood,	1	-	1 40	5,000 00	-	-	-	301 55	-	5,000 00
Oak Bluffs,	3	-	-	821 11	-	-	-	-	-	865 02
Oakham,	3	-	-	149 10	-	-	-	-	-	157 15
Orange,	3	-	-	1,632 86	-	-	-	-	-	1,586 90
Orleans,	3	-	40	2,346 06	-	-	-	-	-	560 42
Oxford,	3	-	-	854 07	-	-	-	-	-	855 22
Palmer,	3	-	-	2,287 93	-	-	-	-	-	2,350 77
Paxton,	3	-	6 84	172 87	-	-	-	-	-	170 68

¹ Arsenate of lead sold.

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.						1918.
		1905 to 1909, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Peabody,	1	\$16,750 89	\$2,313 14	\$5,000 00	-	-	-	\$652 00	-	\$5,000 00
Pembroke,	3	2,010 07	14,411 44	528 25	\$1,679 31	\$985 00	\$1,151 06	1,490 04	\$2,641 10	513 71
Pepperell,	3	1,616 38	11,691 88	978 77	1,874 22	297 27	895 45	691 03	1,586 48	973 33
Petersham,	3	-	-	468 73	-	-	-	-	-	409 08
Phillipston,	3	-	6 84	131 86	-	-	-	-	-	131 28
Plainville,	3	-	520 60	428 75	473 99	180 18	45 24	81 05	126 29	438 51
Plymouth,	1	-	-	5,000 00	-	-	-	-	-	5,000 00
Plympton,	3	7,945 65	13,011 74	188 57	1,508 13	135 00	1,319 56	283 74	1,603 30	198 07
Princeton,	3	-	14,068 60	902 84	2,787 97	132 30	1,885 13	275 41	2,160 54	438 93
Provincetown,	3	-	-	1,111 97	-	-	-	-	-	1,065 05
Quincy,	1	2,170 39	2,152 52	5,000 00	-	-	-	1,264 25	-	5,000 00
Randolph,	3	-	92 74	1,176 00	-	-	-	-	-	1,120 90
Raynham,	3	70 80	1,305 70	402 67	369 09	142 24	-	202 76	169 18	409 97
Reading,	2	22,665 08	14,336 52	3,327 59	3,249 95	2,276 50	-	2,210 60	1,706 37	3,087 12
Rehoboth,	3	-	197 78	432 90	261 24	273 31	-	494 44	197 78	446 94
Revere,	1	1,615 16	-	5,000 00	-	-	-	47 40	-	5,000 00
Rochester,	3	195 09	446 35	425 37	333 44	10 43	-	557 41	340 48	425 89

Rockland,	3	868 39	1,131 13	2,211 25	-	-	-	-	2,091 69
Rockport,	3	1,963 08	1,337 64	1,672 14	-	-	499 50	-	1,674 62
Rowley,	3	3,662 32	7,110 56	924 43	919 03	349 73	1,136 23	1,130 83	388 92
Royalston,	3	-	24 46	303 60	-	-	-	-	321 46
Rutland,	3	-	-	371 92	-	-	-	-	380 48
Salem,	1	11,844 56	365 56	5,000 00	-	-	-	-	5,000 00
Salisbury,	3	7,432 39	10,038 89	717 00	1,242 98	131 40 ¹ 364 14	566 03	1,092 01	753 44
Sandwich,	3	622 91	2,504 50	622 00	526 72	100 08 ¹ 20 00	521 41	426 13	538 70
Saugus,	2	55,011 99	19,145 56	2,932 90	2,804 45	322 24	810 27	545 46	2,979 20
Scituate,	2-3	1,351 60	26,979 25	2,422 83	3,051 88	2,087 90	1,352 95	1,315 01	2,250 97
Seekonk,	3	-	-	839 81	-	-	-	-	805 78
Sharon,	3	-	1,128 79	1,578 09	2,438 44	8 64	1,740 69	1,128 79	1,360 82
Sherborn,	3	3,726 29	4,796 20	1,009 04	1,074 61	682 14	889 36	954 93	655 04
Shirley,	3	-	4,344 04	544 24	868 60	102 00 ¹ 385 15	562 80	887 16	551 63
Shrewsbury,	3	-	1,265 76	1,338 49	2,269 73	496 30	293 30	1,224 54	1,370 92
Somerset,	3	-	-	753 53	260 50	-	-	-	775 25
Somerville,	1	427 52	-	5,000 00	-	-	-	-	5,000 00
Southborough,	3	3,586 16	5,740 36	985 64	1,380 82	709 93	548 56	943 74	867 82
Spencer,	3	-	-	1,462 28	-	-	-	-	1,394 44
Springfield,	1	-	-	5,000 00	-	-	-	-	5,000 00
Sterling,	3	-	5,018 73	559 38	850 17	149 65	362 49	553 28	545 18
Stockbridge,	3	-	-	1,828 02	-	-	-	-	1,783 43

¹ Arsenate of lead sold.

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.						1918.
		1905 to 1909, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Stonham,	2	\$26,874 45	\$7,363 59	\$2,499 86	\$2,499 86	\$1,483 85	-	\$653 57	\$522 86	\$2,544 14
Stoughton,	3	-	2,285 61	1,925 92	1,887 91	541 09	-	656 16	492 15	1,953 36
Stow,	3	2,117 79	10,201 23	464 29	1,102 81	{ 394 46 ¹ 335 28 }	{ \$313 02 }	841 80	1,154 82	404 70
Sturbridge,	3	-	-	382 53	-	-	-	-	-	377 30
Sudbury,	3	4,474 07	12,082 46	672 37	1,210 43	{ 467 79 ¹ 272 94 }	{ 538 06 }	1,009 45	1,547 51	577 93
Sutton,	3	-	-	618 76	-	-	-	163 25	-	615 46
Swampscott,	1	6,903 06	397 71	5,000 00	-	-	-	-	-	5,000 00
Swansea,	3	-	-	810 01	-	-	-	-	-	717 36
Taunton,	1	-	-	5,000 00	-	-	-	163 00	-	5,000 00
Templeton,	3	-	2,923 07	819 06	1,132 28	346 00	313 22	159 83	473 05	838 65
Tewksbury,	3	5,196 08	14,060 63	988 44	1,830 85	631 83	842 41	1,268 84	2,111 25	1,080 63
Tisbury,	3	-	-	970 27	-	-	-	75 50	-	837 94
Topsfield,	3	6,472 26	5,556 47	2,071 56	1,596 69	371 18	-	632 06	157 19	835 27
Townsend,	3	-	8,404 75	585 99	1,140 33	{ 104 42 ¹ 429 36 }	{ 554 34 }	849 92	1,404 26	567 20
Truro,	3	-	192 71	220 42	221 00	11 57	-	-	-	213 19
Tyngsborough,	3	4,512 39	17,701 66	334 41	2,369 99	{ 54 60 ¹ 844 32 }	{ 2,035 58 }	1,091 94	3,127 52	344 27
Upton,	3	-	-	524 31	-	-	-	3 13	-	500 91

Uxbridge,	3	.	.	.	.	1,851 64	-	-	-	-	-	-	1,622 92
Wakefield,	1	.	.	.	.	5,000 00	2,425 09	11,068 41	-	-	-	546 92	5,000 00
Walpole, .	2	.	.	.	.	3,064 53	1,029 76	-	-	-	-	420 80	2,875 16
Waltham,	1	.	.	.	.	5,000 00	8,458 76	6,416 37	12,383 02	3,002 48	-	2,548 97	5,000 00
Ware,	3	.	.	.	.	2,178 37	-	-	-	-	-	-	2,102 10
Wareham,	2	.	.	.	.	2,601 86	-	-	-	-	-	-	2,424 35
Warren, .	3	.	.	.	.	1,088 89	-	-	-	-	-	-	1,055 77
Warwick, .	3	.	.	.	.	188 23	-	-	-	-	-	-	181 58
Watertown,	1	.	.	.	.	5,000 00	2 55	5,270 02	-	-	-	220 05	5,000 00
Wayland, .	3	.	.	.	.	1,358 76	12,250 86	8,505 08	997 93	{ 588 40 ¹ 993 38 }	-	1,163 56	948 84
Webster, .	2-3	.	.	.	.	3,685 51	-	-	-	-	-	-	2,383 03
Wellesley,	1	.	.	.	.	5,000 00	662 96	1,473 50	-	-	-	1,684 50	5,000 00
Wellfleet, .	3	.	.	.	.	340 51	575 36	-	546 81	86 45	81 30	619 06	322 69
Wendell, .	3	.	.	.	.	223 88	-	-	-	-	-	-	228 18
Wenham, .	3	.	.	.	.	1,465 94	9,023 67	9,207 22	1,565 55	431 46	-	596 71	843 92
West Boylston,	3	.	.	.	.	449 45	1,857 87	-	650 74	320 20	201 29	167 66	436 90
West Bridgewater,	3	.	.	.	.	803 76	7,437 90	2,480 22	1,355 48	397 65	551 72	351 87	755 60
West Newbury,	3	.	.	.	.	454 71	7,711 43	12,651 31	584 38	{ 111 32 ¹ 288 44 }	129 67	568 15	406 41
West Tisbury, .	3	.	.	.	.	256 81	-	-	-	-	-	-	232 34
Westborough, .	3	.	.	.	.	1,327 68	3,176 73	-	1,673 44	910 33	345 76	402 25	1,333 93
Westford, .	3	.	.	.	.	991 20	15,572 95 ²	6,594 82	- ³	-	-	1,059 18	929 94
Westminster, .	3	.	.	.	.	405 24	6,257 66	-	1,066 10	149 27	660 86	137 96	394 05

¹ Arsenate of lead sold.² These figures only to 1916.³ These figures not in for 1917.

CITIES AND TOWNS.	Class.	TOTAL AMOUNT RECEIVED FROM STATE.		1917.					1918.	
		1905, inclusive.	1910 to 1917, inclusive.	Required Expenditure.	Total Not Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Weston,	1-3	\$21,108 61	\$19,600 80	\$5,000 00	\$3,035 85	\$2,479 95	-	\$2,034 12	\$359 98	\$1,907 26
Westport,	3	-	-	1,063 72	-	-	-	-	-	1,102 16
Westwood,	3	-	1,028 30	2,370 23	-	-	-	-	-	990 30
Weymouth,	1	3,639 99	2,798 00	5,000 00	-	-	-	-	-	5,000 00
Whatoly,	3	-	5 26	301 28	-	-	-	-	-	319 17
Whitman,	2-3	-	-	2,465 83	-	-	-	-	-	2,270 11
Wilmington,	3	10,969 96	21,272 13	875 87	2,123 39	956 02	\$1,247 52	1,243 02	2,490 54	864 35
Winchendon,	3	-	4,625 85	1,787 01	2,837 56	515 54	1,050 55	325 92	1,376 47	1,791 56
Winchester,	1	14,875 11	-	5,000 00	-	-	-	-	-	5,000 00
Windrop,	1	-	-	5,000 00	-	-	-	81 50	-	5,000 00
Woburn,	1	22,460 09	21,504 96	5,000 00	5,956 90	1,019 80	-	861 17	861 17	5,000 00
Worcester,	1	-	2,990 71	5,000 00	9,582 70	4,456 85	-	2,853 50	750 00	5,000 00
Wrentham,	3	-	643 33	660 53	193 70	227 85	-	1,735 16	643 33	680 35
Yarmouth,	3	-	-	1,025 43	-	-	-	-	-	731 25

MEETINGS AND ADDRESSES.

The department has had the usual calls for addresses and talks from various organizations, and the following list gives the names of various associations that have been attended:—

Acton Woman's Club.
Needham and Wellesley Farmers' Club.
Eastern Foresters' Association, Washington, D. C.
American Forestry Association.
Haverhill Unitarian Church Men's Club.
New England Nurserymen's Association, New London, Conn.
Forest Owners' Club, New York City, N. Y.
Farmers' Institute, Ashby.
Massachusetts Horticultural Society.
Worcester County Harvest Club, Worcester.
New England Federation for Rural Progress.
Waban Beacon Club.
Massachusetts moth superintendents' meeting.
Massachusetts Tree Wardens' and Foresters' Association.
Forest Fire Insurance Association, Concord, N. H.
Shirley Farmers' Club.
Berlin Tuesday Club.
Eastern Lumbermen's Association, Bangor, Me.
University of Maine, Forestry School.
Congregational Club, Auburndale.
Eastern Shook and Wooden Box Association.
Boston City Club.
Walpole Arbor Day Celebration.
Farmers' Institute, Edgartown.
Eastern Foresters' Association, Plattsburg, N. Y.
Cape Cod Cranberry Association, Wareham.
Stockbridge Town Club.
Nantucket citizens' meeting.
Cape Cod moth officials, Bourne.
Westford Grange.
Hampshire County Pomona Grange.
Worcester and Norfolk Pomona Grange.
Society for the Promotion of Agricultural Science, Washington, D. C.
Massachusetts State Board of Agriculture.
Massachusetts State Grange.
Appalachian Mountain Club, Director.
Berlin Men's Club.
Duxbury, Mayflower Pomona Grange.
Medfield, Conservation Committee of Federation of Women's Clubs.
Foxborough Grange.

Belmont, citizens' meeting.
State Grange meeting at Cummington.
Warwick, Mount Grace meeting.
Salisbury, citizens' meeting.
Salem, Universalist Men's Club.
Rowley, citizens' meeting.
Newburyport, citizens' meeting.
Merrimac, citizens' meeting.
Manchester, public meeting.
Haverhill, Order of Moose.
Tree Wardens' Convention.
Danvers, citizens' meeting.
Haverhill, Universalist Club.
Boxford Men's Club.
Beverly, conservation committee.
Haverhill, Order of American Mechanics.
Amesbury, citizens' meeting.
Stockbridge Men's Club.
Public schools, Cambridge.
Worcester County Extension School, Royalston.
Hubbardston's Men's Club, Hubbardston.
Daughters American Revolution, Natick.
Hampden League Council, Brimfield.
Hampden League Council, Montgomery.



An example of how indifferently roadside trees are cared for in some sections of the State. The lumberman has cut everything to the road on the right-hand side, and the few would-be trees have the heart taken out of them by the telephone poles and wires on the other side. Hundreds of instances may be seen of equal maltreatment of roadsides in the State due to lack of a uniform State-wide supervision and direction of effort.



The effect of white pine growth bordering a State highway. These trees are about one-half grown. They are beautiful in winter or summer, are not expensive to care for, and greatly increase the value of forest products for the section. The danger from forest fires is much less with pines, as the needles adhere more closely to the ground and are less combustible than deciduous leaves (Middleborough).

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS.

[Alphabetically by towns and cities.]

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
157-W, Rockland,	Sumner L. Deane,	Abington, . .	C. F. Shaw, . .	4
71-4, West Acton,	Wm. H. Kingsley,	Acton, . . .	J. O'Neil, . . .	2
2003-M, New Bedford.	Henry F. Taber,	Acushnet, . .	A. P. R. Gilmore, . .	3
201, Kippers,	John Clancy, . .	Adams, . . .	John Clancy, . . .	5
6465-M, River,	E. M. Hitchcock,	Agawam, . . .	E. M. Hitchcock, . .	5
161-6, Great Barrington.	W. F. Milligan, .	Alford, . . .	- - -	-
274-M, . . .	Jas. E. Feltham,	Amesbury, . .	A. L. Stover, . . .	1
541-M, . . .	A. F. Bardwell, .	Amherst, . . .	W. H. Smith, . . .	5
324-M, . . .	Chas. S. Buchan,	Andover, . . .	J. H. Playdon, . . .	1
35 and 206, . .	Walter H. Pierce,	Arlington, . .	Daniel M. Daley, . .	1
- -	John T. Withington,	Ashburnham,	Charles H. Pratt, . .	2
2-3, . . .	W. S. Green, . . .	Ashby, . . .	Fred C. Allen, . . .	2
3-5, . . .	Ralph Tredick, . .	Ashfield, . . .	Charles A. Smith, . .	5
704-M and 199, .	H. H. Piper, . . .	Ashland, . . .	Theodore P. Hall, . .	2
6 and 48-5, . .	Frank P. Hall, . .	Athol, . . .	W. S. Penniman, . .	5
64-R-4, . . .	H. R. Packard, . .	Attleboro, . .	W. E. S. Smith, . . .	3
5-12, . . .	J. F. Searle, . . .	Auburn, . . .	B. F. Searle, . . .	5
3259-M, . . .	J. W. McCarty, . .	Avon, . . .	W. W. Beals, . . .	3
123-2, . . .	D. C. Smith, . . .	Ayer, . . .	D. C. Smith, . . .	2
144-2, . . .	H. C. Bacon, . . .	Barnstable, . .	Robert Cross, . . .	4
83-4, . . .	A. E. Traver, . . .	Barre, . . .	James A. Dwinnell, . .	5
8000 and 18, . .	P. B. McCormick,	Becket, . . .	- - -	-
- -	Irving C. Waite, .	Bedford, . . .	W. A. Cutler, . . .	2
- -	J. A. Peeso, . . .	Belchertown, . .	E. C. Howard, . . .	5
8936-2, Milford, .	L. F. Thayer, . . .	Bellingham, . .	Lewis E. Whitney, . .	3
409-W, . . .	John F. Leonard, .	Belmont, . . .	Martin Troy, . . .	2
1367-M, . . .	Gideon H. Babbitt,	Berkley, . . .	A. A. Briggs, . . .	3
24-4, . . .	E. Guy Sawyer, . .	Berlin, . . .	E. C. Ross, . . .	2
43-12, . . .	Edson W. Hale, . .	Bernardston, . .	Edwin D. Hale, . . .	5
20, . . .	Robert H. Grant,	Beverly, . . .	Jas. W. Blackmer, . .	1
- -	Mark E. Allen, . .	Billerica, . . .	Fred L. Winship, . .	2
9250, . . .	John H. Dwyer, . .	Blackstone, . .	A. J. Duggan, . . .	5
16-3, . . .	I. E. Whitney, . .	Blandford, . .	- - -	-
9-3, . . .	Albert I. Pardee, .	Bolton, . . .	C. E. Mace, . . .	2
- -	- - -	Boston, . . .	Wm. P. Long, . . .	1
38, . . .	Walter E. R. Nye,	Bourne, . . .	Edw. D. Nickerson, . .	4

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
102-2, West Acton,	H. J. Livermore,	Boxborough,	C. E. Sherry,	2
19-25, . . .	Clarence E. Brown,	Boxford,	C. Perley,	1
4-4, . . .	John N. Flagg,	Boylston,	Walter G. Brigham,	5
433-R, . . .	James M. Cutting,	Braintree,	Clarence R. Bestick,	3
76-R-23, . . .	T. B. Tubman,	Brewster,	Allison D. Rogers,	4
281-3, . . .	F. C. Worthen,	Bridgewater,	F. C. Worthen,	4
18-2, . . .	G. E. Hitchcock,	Brimfield,	C. W. King,	5
- -	Wm. F. Daly,	Brockton,	Rufus H. Carr,	4
109-13, . . .	P. E. Gadaire,	Brookfield,	J. H. Conant,	5
- -	Geo. H. Johnson,	Brookline,	Ernest B. Dane,	1
- -	Gilbert E. Griswold,	Buckland,	- - -	-
15-4, . . .	Walter W. Skelton,	Burlington,	W. W. Skelton,	2
- -	- - -	Cambridge,	J. F. Donnelly,	2
24-M and 21048,	Ralph C. Crowell,	Canton,	Wm. H. Gallivan,	3
76-M, Concord,	Geo. G. Wilkins,	Carlisle,	G. G. Wilkins,	2
16-2, . . .	Herbert F. Atwood,	Carver,	H. F. Atwood,	4
14-12, . . .	Albert L. Veber,	Charlemont,	- - -	-
42-2, . . .	Edward A. Lamb,	Charlton,	J. D. Fellows,	5
28-3, . . .	Geo. W. Ryder,	Chatham,	Chas. R. Nickerson,	4
1597-R, . . .	Arnold C. Perham,	Chelmsford,	M. A. Bean,	2
- -	- - -	Chelsea,	J. A. O'Brien,	1
- -	S. W. Curtis,	Cheshire,	- - -	-
- -	Wm. H. Babb,	Chester,	- - -	-
4-2, . . .	Chas. A. Bisbee,	Chesterfield,	- - -	-
149-M and 149-W,	John E. Pomphret,	Chicopee,	Edw. Bourbeau,	5
- -	Robert W. Vincent,	Chilmark,	A. S. Tilton,	4
352-24, . . .	D. W. Blanchard,	Clarksburg,	F. E. Bishop,	5
312-W, . . .	A. J. Robinson,	Clinton,	Peter R. Gibbons,	2
260, . . .	Wm. J. Brennock,	Cohasset,	George Young,	4
23-2, . . .	Frank A. Walden,	Colrain,	Edgar F. Copeland,	5
75-W, . . .	Harry E. Tuttle,	Concord,	H. P. Richardson,	2
- -	Edgar Jones,	Conway,	- - -	-
- -	Thomas A. Gabb,	Cummington,	- - -	-
86-W, . . .	S. L. Caesar,	Dalton,	- - -	-
- -	T. L. Thayer,	Dana,	T. L. Thayer,	5
417-M, . . .	M. H. Barry,	Danvers,	T. E. Tinsley,	1
1658-5, . . .	Chas. H. Mead,	Dartmouth,	E. M. Munson,	3

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
35-R, . . .	Henry J. Harrigan, .	Dedham, . . .	J. T. Kennedy, .	3
- -	Wm. L. Harris, .	Deerfield, . . .	Wm. S. Harris, .	5
8118-4, . . .	Chas. E. Pierce, .	Dennis, . . .	Joshua Crowell, .	4
29-3, . . .	Ralph Earle, . . .	Dighton, . . .	Albert N. Goff, .	3
11-4, . . .	W. L. Church, . . .	Douglas, . . .	F. J. Libby, . . .	5
63-11, . . .	John Breagy, . . .	Dover, . . .	H. L. MacKenzie, .	3
- -	Frank H. Gunther, .	Dracut, . . .	T. F. Carrick, . .	2
- -	Frank A. Putnam, .	Dudley, . . .	Herbert J. Hill, .	5
5-11, Tyngsbor- ough.	Archie W. Swallow, .	Dunstable, . . .	W. H. Savill, . . .	2
82-2, . . .	H. E. Merry, . . .	Duxbury, . . .	John D. Morrison, .	4
8110, . . .	H. L. Belknap, . . .	E. Bridgewater, .	Lester W. Bourne, .	4
- -	Asher Markham, . .	E. Longmeadow, .	Herman W. King, .	5
24-3, . . .	Adin L. Gill, . . .	Eastham, . . .	N. P. Clark, . . .	4
306-12, . . .	John M. Dineen, . .	Easthampton, . .	Chas. Kuhfuss, . .	5
76 and 67, . . .	Frederick Hanlon, .	Easton, . . .	R. W. Melendy, . .	3
241-2, . . .	Manuel Swartz, . . .	Edgartown, . . .	John P. Fuller, . .	4
165-25, . . .	Frank W. Bradford, .	Egremont, . . .	- - -	-
17-11, . . .	H. A. Coolbeth, . .	Enfield, . . .	H. C. Moore, . . .	5
- -	C. H. Holmes, . . .	Erving, . . .	Chas. H. Holmes, .	5
- -	Otis O. Story, . . .	Essex, . . .	O. O. Story, . . .	1
- -	- - -	Everett, . . .	P. O. Sefton, . . .	2
1686-Y, . . .	C. F. Benson, . . .	Fairhaven, . . .	G. W. King, . . .	3
822-W, . . .	Wm. Stevenson, . . .	Fall River, . . .	Wm. Stevenson, . .	3
136-2, . . .	H. H. Lawrence, . . .	Falmouth, . . .	W. W. Eldridge, Jr.,	4
745, . . .	Page S. Bunker, . . .	Fitchburg, . . .	Dwight S. Woodworth,	2
9417-3, H o o s a c Tunnel pay sta- tion.	Horace B. Brown, . .	Florida, . . .	- - -	-
76 and 96-5, . .	Ernest A. White, . .	Foxborough, . . .	F. S. Richardson, .	3
352-4, . . .	Bert P. Winch, . . .	Framingham, . . .	N. I. Bowditch, . .	2
66-12, . . .	Edward S. Cook, . . .	Franklin, . . .	J. W. Stobbart, . .	3
8-3, . . .	A. M. Hathaway, . .	Freetown, . . .	G. M. Nichols, . . .	3
161 and 191, . .	Geo. S. Hodgman, . .	Gardner, . . .	T. W. Danforth, . .	5
- -	L. B. Smalley, . . .	Gay Head, . . .	J. W. Belain, . . .	4
71-12 and 8046-2,	Thos. C. Watson, . .	Georgetown, . . .	Elwood T. Wildes, .	1
15-12, Bernards- ton.	Lewis C. Munn, . . .	Gill, . . .	Chas. H. Whitaker, .	5
1380 and 1043, .	Geo. W. O'Maley, . .	Gloucester, . . .	Geo. W. O'Maley, .	1
18-4, . . .	John S. Mollison, . .	Goshen, . . .	- - -	-
- -	Harold S. Veeder, . .	Gosnold, . . .	- - -	-

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
18-2, . . .	Elmer E. Sibley, .	Grafton, . . .	C. K. Despeau, .	5
- -	Geo. L. Murray, .	Granby, . . .	George A. Harris, .	5
25, . . .	Harry A. Root, .	Granville, . . .	- - -	-
327-W, . . .	D. W. Flynn, . .	Gt. Barrington, .	T. J. Kearin, . .	5
1185, . . .	J. W. Bragg, . . .	Greenfield, . . .	J. W. Bragg, . . .	5
33-24, Enfield, .	W. H. Walker, . .	Greenwich, . . .	B. A. Sawtelle, .	5
71-5, . . .	C. M. Raddin, . .	Groton, . . .	Herbert W. Taylor, .	2
2939-M, . . .	S. E. Johnson, . .	Groveland, . . .	R. D. Larive, . .	1
651-33, . . .	E. P. West, . . .	Hadley, . . .	Leroy C. Sabin, .	5
5-2, . . .	Wm. L. Robertson, .	Halifax, . . .	F. D. Lyon, . . .	4
- -	Fred Berry, . . .	Hamilton, . . .	E. G. Brewer, . .	1
5-14, . . .	Edward P. Lyons, .	Hampden, . . .	- - -	-
17-F-2, . . .	Charles Tucker, .	Hancock, . . .	- - -	-
51-5, Rockland, .	Chas. E. Damon, .	Hanover, . . .	L. Russell, . . .	4
12-23, . . .	Geo. T. Moore, . .	Hanson, . . .	George T. Moore, .	4
3-12, . . .	George Fay, . . .	Hardwick, . . .	George J. Fay, . .	5
46-3, . . .	Benjamin J. Priest, .	Harvard, . . .	G. C. Maynard, .	2
103-3, . . .	John Condon, . . .	Harwich, . . .	Arthur F. Cahoon, .	4
72-4, . . .	Fred T. Bardwell, .	Hatfield, . . .	Seth W. Kingsley, .	5
- -	John B. Gordon, .	Haverhill, . . .	M. J. Fitzgerald, .	1
17-7, . . .	Herbert A. Holden, .	Hawley, . . .	- - -	-
5-18, . . .	S. G. Benson, . . .	Heath, . . .	- - -	-
500, . . .	George Cushing, .	Hingham, . . .	T. L. Murphy, . .	4
7-12, . . .	A. N. Warren, . .	Hinsdale, . . .	- - -	-
130-R, Randolph, .	Melvin L. Coulter, .	Holbrook, . . .	Bradford Parks, .	3
42-4, . . .	Winfred H. Stearns, .	Holden, . . .	W. H. Stearns, . .	5
5-21, Brimfield, .	Oliver L. Howlett, .	Holland, . . .	W. A. Morse, . . .	5
113, . . .	W. A. Collins, . . .	Holliston, . . .	Herbert E. Jones, .	2
1167-W, . . .	C. J. Haley, . . .	Holyoke, . . .	T. A. Bray, . . .	5
248-W, . . .	S. E. Kellogg, . .	Hopedale, . . .	C. E. Nutting, . .	5
19, . . .	George W. Smith, .	Hopkinton, . . .	W. A. MacMillan, .	5
35-11, . . .	W. L. Lovewell, . .	Hubbardston, . .	Ralph W. Hartwell, .	5
24, . . .	M. P. Mitchell, . .	Hudson, . . .	George A. Coolidge, .	2
- -	- - -	Hull, . . .	J. Knowles, . . .	4
4-11, . . .	John J. Kirby, . .	Huntington, . .	- - -	-
74-R, . . .	Arthur H. Walton, .	Ipswich, . . .	J. A. Morey, . . .	1
- -	Dr. A. B. Holmes, .	Kingston, . . .	Chas. H. Childs, .	4

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS—*Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
261-W, . . .	N. F. Washburn, . .	Lakeville, . . .	N. F. Washburn, . .	4
- -	Arthur W. Blood, . .	Lancaster, . . .	L. R. Griswold, . .	2
1295-24, . . .	King D. Keeler, . . .	Lanesborough, . .	George H. Judivine, .	5
362,	D. E. Carey,	Lawrence,	John A. Flanagan, . .	1
66-M,	James W. Bossidy, . .	Lee,	- - -	-
37-5,	B. H. Fogwell, . . .	Leicester,	J. H. Woodhead, . .	5
- -	Oscar R. Hutchinson, .	Lenox,	T. Francis Mackey, . .	5
28, 29 and 546, . .	F. A. Russell,	Leominster,	D. E. Bassett, . . .	2
- -	Mellen H. Briggs, . .	Leverett,	I. H. Taylor,	5
1104-R,	Osborne J. Gorman, . .	Lexington,	O. J. Gorman,	2
274-41, Greenfield, .	Jacob Sauter,	Leyden,	Jacob Sauter,	5
44-W,	John J. Kelliher, . . .	Lincoln,	J. J. Kelliher,	2
17-4,	A. E. Hopkins,	Littleton,	A. E. Hopkins,	2
- -	Oscar C. Pomeroy, . .	Longmeadow, . . .	- - -	-
3400,	Edw. F. Saunders, . . .	Lowell,	J. G. Gordon,	2
1-12,	H. A. Munsing,	Ludlow,	Ashley N. Bucher, . .	5
20,	J. S. Gilcrest,	Lunenburg,	James S. Gilcrest, . .	2
1174 and 3015, . . .	George A. Cornet, . . .	Lynn,	Arthur W. Lewis, . . .	1
9-3,	Lewis F. Pope,	Lynnfield,	L. H. Twiss,	1
- -	Watson B. Gould, . . .	Malden,	W. B. Gould,	2
319-W,	Peter A. Sheahan, . . .	Manchester,	P. A. Sheahan,	1
1-R and 281-W, . .	Herbert E. King, . . .	Mansfield,	E. Jasper Fisher, . . .	3
- -	John T. Adams,	Marblehead,	W. J. Stevens,	1
117-2,	George B. Nye,	Marion,	J. Allenach,	4
- -	Edward C. Minehan, . .	Marlborough, . . .	M. E. Lyons,	2
43-3,	W. G. Ford,	Marshfield,	P. R. Livermore, . . .	4
31-2, Cotuit, . . .	Darius Coombs,	Mashpee,	S. Henry Peters, . . .	4
13-3,	Frank Tinkham,	Mattapoisett, . . .	Frank A. Tinkham, . .	4
- -	Geo. H. Gutteredge, . .	Maynard,	A. Coughlin,	2
119-4,	William E. Bell,	Medfield,	G. L. L. Allen,	3
- -	Chas. E. Bacon,	Medford,	Hugh G. Kennedy, . . .	2
6-2,	John B. Durfee,	Medway,	F. Hager,	3
- -	- - -	Melrose,	J. J. McCullough, . .	2
188-M,	F. M. Aldrich,	Mendon,	F. M. Aldrich,	5
85,	Chas. E. Hoyt,	Merrimac,	C. R. Ford,	1
2747,	W. M. Freeman,	Methuen,	A. H. Wagland,	1
232-W,	W. H. Connor,	Middleborough, . .	John J. Fowler,	4

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
8000, . . .	G. E. Cook, . . .	Middlefield, . . .	- - -	-
63-25 and 63-14, .	L. G. Esty, . . .	Middleton, . . .	B. T. McGlauffin, . .	1
37-M, . . .	E. J. Burke, . . .	Milford, . . .	P. F. Fitzgerald, . .	5
152-2, . . .	Harry L. Snelling, .	Millbury, . . .	E. F. Roach, . . .	5
5-2, . . .	Charles LaCroix, . .	Millis, . . .	Everett Caldwell, . .	3
1442-25, . . .	Ralph S. Carpenter, .	Milton, . . .	Ralph S. Carpenter, .	3
1149-J-1, . . .	Robert McLaughlin, .	Millville, . . .	Robert McLaughlin, .	5
8-22, Readsboro, Vt., . . .	Huel S. Tower, . . .	Monroe, . . .	- - -	-
12-22, . . .	O. E. Bradway, . . .	Monson, . . .	Robt. S. Fay, . . .	5
14-4, . . .	Thomas Berard, . . .	Montague, . . .	F. H. Gillette, . . .	5
164-25, . . .	Jasper H. Bills, . . .	Monterey, . . .	- - -	-
3-24, . . .	A. J. Hall, . . .	Montgomery, . . .	- - -	-
17-6, . . .	Howard Porter, . . .	Mt. Washington, . .	- - -	-
- -	- - -	Nahant, . . .	T. Roland, . . .	1
16-3, . . .	E. W. Francis, . . .	Nantucket, . . .	George M. Winslow, .	4
- -	Wm. H. Connelly, . .	Natick, . . .	S. H. Hunnewell, . .	2
195-W, . . .	H. H. Upham, . . .	Needham, . . .	E. E. Riley, . . .	3
- -	Chas. S. Baker, . . .	New Ashford, . . .	- - -	-
- -	Edward F. Dahill, . .	New Bedford, . . .	C. F. Lawton, . . .	3
6-4, Gilbertville,	Frank A. Morse, . . .	New Braintree, . . .	E. L. Havens, . . .	5
8005-2, . . .	E. M. Stanton, . . .	New Marlbor- ough, . . .	- - -	-
10, Cooleyville, .	Sewall V. King, . . .	New Salem, . . .	Sewall V. King, . . .	5
1112-5, . . .	Wm. P. Bailey, . . .	Newbury, . . .	Percy Oliver, . . .	1
380, . . .	Chas. P. Kelley, . . .	Newburyport, . . .	C. P. Kelley, . . .	1
30, Newton South,	W. B. Randlett, . . .	Newton, . . .	W. W. Colton, . . .	2
129-4, Franklin, .	Lester J. Murphy, . .	Norfolk, . . .	James T. Buckley, . .	3
205-W, . . .	H. J. Montgomery, . .	North Adams, . . .	Jackson L. Temple, . .	5
1029-J, . . .	Wm. L. Smith, . . .	No. Andover, . . .	Wm. L. Smith, . . .	1
- -	H. W. Tufts, . . .	North Attlebor- ough, . . .	F. P. Toner, . . .	3
63-4, . . .	Oscar C. Hirbour, . .	North Brookfield, . .	S. D. Colburn, . . .	5
49, . . .	Geo. E. Eaton, . . .	North Reading, . . .	G. E. Eaton, . . .	2
165, . . .	F. E. Chase, . . .	Northampton, . . .	Chas. A. Maynard, . .	5
12-11, . . .	Clarence E. Bailey, . .	Northborough, . . .	Lewis H. Smith, . . .	5
71-5 and 182, . .	W. E. Burnap, . . .	Northbridge, . . .	A. F. Whitin, . . .	5
114-2, . . .	F. W. Doane, . . .	Northfield, . . .	F. W. Doane, . . .	5
29-11, . . .	Geo. H. Storer, . . .	Norton, . . .	G. H. Storer, . . .	3
7-12, . . .	J. H. Sparrell, . . .	Norwell, . . .	J. H. Sparrell, . . .	4

LIST OF FOREST WARDENS AND LOCAL MOTHS SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
417-M, . . .	F. W. Talbot, . . .	Norwood, . . .	C. A. Bingham, . . .	3
119-4, . . .	Harold W. Chase, . . .	Oak Bluffs, . . .	Frank F. Blanken- ship.	4
17-5, . . .	C. H. Trowbridge, . . .	Oakham, . . .	C. H. Trowbridge, . . .	5
232-12, . . .	Wm. Walsh, . . .	Orange, . . .	Jas. W. Cooper, . . .	5
33-2, . . .	James Boland, . . .	Orleans, . . .	A. Smith, . . .	4
- -	Durand A. Witter, . . .	Otis, . . .	- - -	-
9-5, . . .	Olin D. Vickers, . . .	Oxford, . . .	C. G. Larned, . . .	5
53-3 and 53-12, . . .	James Summers, . . .	Palmer, . . .	C. H. Keith, . . .	5
- -	F. L. Durgin, . . .	Paxton, . . .	F. L. Durgin, . . .	5
- -	John J. Callahan, . . .	Peabody, . . .	J. J. Callahan, . . .	1
59-R and 59-W, Amherst.	John Hubbard, . . .	Pelham, . . .	Marion E. Richard- son.	5
83-3, Bryantville, 8029-2, Bryant- ville, 8007-13, Hanover.	Joseph J. Shepherd, . . .	Pembroke, . . .	Wm. C. Jones, . . .	4
23-21, . . .	G. M. Palmer, . . .	Pepperell, . . .	J. Tune, . . .	2
11-2, Hinsdale, . . .	Arthur Kilbourne, . . .	Peru, . . .	- - -	-
61, . . .	George Marsh, . . .	Petersham, . . .	Daniel Broderick, . . .	5
228-Y, Athol, . . .	Wm. H. Cowlbeck, . . .	Phillipston, . . .	W. H. Cowlbeck, . . .	5
834 and 535-M, . . .	Chas. L. Klein, . . .	Pittsfield, . . .	- - -	-
33-11, . . .	F. J. Butler, . . .	Plainfield, . . .	- - -	-
- -	Henry F. Boerger, . . .	Plainville, . . .	George H. Snell, . . .	3
264, . . .	Ira C. Ward, . . .	Plymouth, . . .	A. A. Raymond, . . .	4
13-7, Kingston, . . .	David L. Bricknell, . . .	Plympton, . . .	D. L. Bricknell, . . .	4
19-4, Cooleyville, . . .	Fred W. Doubleday, . . .	Prescott, . . .	C. M. Pierce, . . .	5
13-4, . . .	Fred W. Bryant, . . .	Princeton, . . .	F. A. Skinner, . . .	5
49-11, . . .	J. H. Barnett, . . .	Provincetown, . . .	J. M. Burch, . . .	4
1, . . .	Faxon T. Billings, . . .	Quincy, . . .	A. J. Stewart, . . .	3
279, . . .	R. F. Forrest, . . .	Randolph, . . .	John T. Moore, . . .	3
1161-W, . . .	E. E. Chickering, . . .	Raynham, . . .	G. M. Leach, . . .	3
518-W, . . .	H. E. McIntire, . . .	Reading, . . .	H. M. Donegan, . . .	2
11-12, . . .	B. F. Munroe, . . .	Rehoboth, . . .	R. E. Anderson, . . .	3
- -	- - -	Revere, . . .	G. P. Babson, . . .	1
8-2, . . .	Timothy B. Salmon, . . .	Richmond, . . .	- - -	-
12-32, . . .	Daniel E. Hartley, . . .	Rochester, . . .	Samuel H. Corse, . . .	4
55-X, . . .	John H. Burke, . . .	Rockland, . . .	F. H. Shaw, . . .	4
14-4, . . .	John C. Martin, . . .	Rockport, . . .	F. A. Babcock, . . .	1
21-6, . . .	M. A. Peck, . . .	Rowe, . . .	- - -	-
3-13, . . .	Daniel O'Brien, . . .	Rowley, . . .	Chas. Curtis, . . .	1

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
279-2, . . .	L. G. Forbes, . .	Royalston, . .	P. F. Richards, . .	5
2-12, . . .	S. S. Shurtleff, . .	Russell, . .	- - -	-
4-12, . . .	Henry Converse, . .	Rutland, . .	H. E. Wheeler, . .	5
- -	- - -	Salem, . .	Warren F. Hale, . .	1
- -	James H. Pike, . .	Salisbury, . .	H. C. Rich, . .	1
202-3, . . .	C. D. Strickland, . .	Sandisfield, . .	- - -	-
43-2, . . .	J. R. Holway, . .	Sandwich, . .	B. F. Dennison, . .	4
- -	Thos. E. Berrett, . .	Saugus, . .	T. E. Berrett, . .	1
4-16, . . .	C. E. Tilton, . .	Savoy, . .	- - -	-
129-3, . . .	E. R. Seaverns, . .	Scituate, . .	Wm. F. Ford, . .	4
462-J-2, P a w - tucket.	John L. Baker, . .	Seekonk, . .	C. A. Smith, . .	3
10, . . .	W. C. Morse, . .	Sharon, . .	J. J. Geissler, . .	3
26, . . .	A. H. Tuttle, . .	Sheffield, . .	- - -	-
130-2, . . .	Chas. F. Dole, . .	Shelburne, . .	Chas. F. Dole, . .	5
- -	Milo F. Campbell, . .	Sherborn, . .	Geo. W. Rock, . .	2
- -	Asa A. Adams, . .	Shirley, . .	A. A. Adams, . .	2
- -	E. A. Logan, . .	Shrewsbury, . .	Robt. C. Clark, . .	5
2-14, Cooleyville,	Nathan J. Hunting, . .	Shutesbury, . .	Clarence A. Haskell, . .	5
2632-M, . . .	Wm. F. Griffiths, . .	Somerset, . .	C. Riley, . .	3
- -	- - -	Somerville, . .	A. B. Prichard, . .	2
22, . . .	L. H. Lamb, . .	So. Hadley, . .	Louis H. Lamb, . .	5
151-23, . . .	C. S. Olds, . .	Southampton, . .	C. S. Olds, . .	5
13, Marlborough, 3505 Fort Hill.	Harry Burnett, . .	Southborough, . .	H. Burnett, . .	5
11, . . .	Aimee Langevin, . .	Southbridge, . .	J. Langevin, . .	5
35-3, . . .	B. M. Hastings, . .	Southwick, . .	- - -	-
77-3, . . .	A. F. Howlett, . .	Spencer, . .	G. Ramer, . .	5
20, . . .	C. S. Taylor, . .	Springfield, . .	J. Alden Davis, . .	5
5-12, . . .	J. T. Wilder, . .	Sterling, . .	J. H. Kilburn, . .	2
53-M, . . .	Geo. Schneyer, . .	Stockbridge, . .	George Schneyer, . .	5
176-12, . . .	Albert J. Smith, . .	Stoneham, . .	G. M. Jefts, . .	2
276-2 and 121-3, . .	Fred H. Pye, . .	Stoughton, . .	W. P. Kennedy, . .	3
- -	Wm. H. Parker, . .	Stow, . .	H. W. Herrick, . .	2
6-1, . . .	C. M. Clark, . .	Sturbridge, . .	C. M. Clark, . .	5
- -	Seneca W. Hall, . .	Sudbury, . .	W. E. Baldwin, . .	2
46, . . .	A. C. Warner, . .	Sunderland, . .	Richard Graves, . .	5
58-32, . . .	R. H. Richardson, . .	Sutton, . .	R. H. Richardson, . .	5
1911-J, . . .	Everett P. Mudge, . .	Swampscott, . .	E. P. Mudge, . .	1

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
468-W, . . .	Thos. L. Mason, . .	Swansea, . . .	A. E. Arnold, . . .	3
1-320, . . .	Fred A. Leonard, . .	Taunton, . . .	L. W. Hodgkins, . .	3
78-2, 78-3 and 30,	C. A. Fletcher, . . .	Templeton, . . .	J. B. Wheeler, . . .	5
4249-J, . . .	Harris M. Briggs, . .	Tewksbury, . . .	H. M. Briggs, . . .	2
102-3 and 161-4, .	Elmer C. Chadwick, .	Tisbury, . . .	H. W. McLellan, . .	2
269-5, Winsted, Conn. - -	Rupert E. Clark, . .	Tolland, . . .	- - -	-
- -	T. Jesse Fuller, . . .	Topsfield, . . .	Harland S. Peirce, .	1
70 and 51-2, . . .	F. J. Piper, . . .	Townsend, . . .	G. E. King, . . .	2
- -	Walter F. Rich, . . .	Truro, . . .	J. H. Atwood, . . .	4
1, . . .	Otis L. Wright, . . .	Tyngsborough, . .	C. J. Allgrove, . . .	2
3-6, . . .	Clifford R. Canon, . .	Tyringham, . . .	- - -	-
8000 and 15-2, . .	Geo. L. Williams, . .	Upton, . . .	Clarence L. Goodrich,	5
101, . . .	H. W. Phoenix, . . .	Uxbridge, . . .	Willard Holbrook, .	5
58 and 455-M, . .	W. E. Cade, . . .	Wakefield, . . .	W. W. Whittredge, .	2
9-11 and 9-23, Brimfield.	L. H. Thompson, . .	Wales, . . .	M. C. Royce, . . .	5
107-2, . . .	Jas. J. Hennessey, .	Walpole, . . .	Philip R. Allen, . .	3
6, . . .	Geo. L. Johnson, . .	Waltham, . . .	W. M. Ryan, . . .	2
117-13, . . .	Joseph Dupre, . . .	Ware, . . .	F. Leissig, . . .	5
45-23, . . .	Delbert C. Keyes, . .	Wareham, . . .	J. J. Walsh, . . .	4
- -	Timothy M. Collins, .	Warren, . . .	Alex A. Gendron, . .	5
- -	C. A. Williams, . . .	Warwick, . . .	Chas. Bass, . . .	5
12-4, Becket, . .	Lester G. Heath, . .	Washington, . . .	- - -	-
- -	John C. Ford, . . .	Watertown, . . .	Van D. Horton, . . .	2
31-3, Wayland, . .	Howard C. Haynes, . .	Wayland, . . .	D. J. Graham, . . .	2
101-R, . . .	E. L. Wallis, . . .	Webster, . . .	C. Klebart, . . .	5
9 and 724-M, . . .	John P. Doyle, . . .	Wellesley, . . .	George Goodyear, . .	3
- -	John Holbrook, . . .	Wellfleet, . . .	Wm. H. Gill, . . .	4
6-23, . . .	Chas. A. Fiske, . . .	Wendell, . . .	G. E. Mills, . . .	5
- -	Jacob D. Barnes, . .	Wenham, . . .	J. E. Kavanagh, . .	1
8-23, . . .	Arthur J. Hunting, . .	W. Boylston, . . .	Harry E. Lowe, . . .	5
- -	Warren P. Laughton, .	W. Bridgewater, . .	O. Belmore, . . .	4
114-3, No. Brook- field.	John H. Webb, . . .	W. Brookfield, . .	J. H. Webb, . . .	5
- -	Louis H. Flook, . . .	W. Newbury, . . .	Frank E. Bailey, . .	1
6961-J and 1504, .	E. B. Jones, . . .	W. Springfield, . .	George W. Haven, . .	5
8010, . . .	B. P. Bissell, . . .	W. Stockbridge, . .	- - -	-
92-3, . . .	Wm. J. Rotch, . . .	W. Tisbury, . . .	H. M. Athearn, . . .	4
119-3, . . .	Thos. Humphrey, . .	Westborough, . . .	George Haven, . . .	5

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
111-Y and 111-W,	Thos. H. Mahoney, .	Westfield, . .	- - -	-
44-11, . . .	H. L. Nesmith, . .	Westford, . .	H. L. Nesmith, .	2
148-14, . . .	Clayton A. Bartlett, .	Westhampton, .	- - -	-
1-3, . . .	W. F. Neal, . . .	Westminster, .	G. A. Sargent, . .	5
- -	B. R. Parker, . . .	Weston, . . .	E. P. Ripley, . .	2
41-21, . . .	Frank Whalon, . . .	Westport, . . .	H. A. Sanford, . .	3
- -	Elmer E. Smith, . .	Westwood, . .	Martin Sorenson, .	3
185-M and 21689,	Walter W. Pratt, . .	Weymouth, . .	C. L. Merritt, . .	3
39-14, . . .	John H. Pease, . . .	Whately, . . .	Rylan C. Howes, .	5
349-W, . . .	C. A. Randall, . . .	Whitman, . . .	C. A. Randall, . .	4
1-4, . . .	Henry I. Edson, . .	Wilbraham, . .	Henry I. Edson, .	5
- -	John L. Brown, . .	Williamsburg, .	- - -	-
34-W, . . .	W. H. Davies, . . .	Williamstown, .	William Davies, . .	5
28-2, . . .	Oliver McGrane, . .	Wilmington, . .	Oliver McGrane, .	2
196-3, . . .	Wm. F. Clark, . . .	Winchendon, . .	Joseph W. Crocket, .	5
- -	David DeCourcy, . .	Winchester, . .	S. S. Symmes, . .	2
- -	Amos S. Ferry, . . .	Windsor, . . .	- - -	-
- -	- - -	Winthrop, . . .	Fred A. Whittemore,	1
- -	Frank E. Tracy, . .	Woburn, . . .	H. V. Macksey, . .	2
7137, Park, . .	Wesley N. Avery, . .	Worcester, . . .	H. J. Neale, . . .	5
10-22, . . .	Chas. A. Kilbourn, .	Worthington, . .	- - -	-
69, . . .	Geo. H. E. Mayshaw, .	Wrentham, . . .	H. Gilmore, . . .	3
58-31, Barnstable,	Joseph W. Hamblin, .	Yarmouth, . . .	C. R. Bassett, . .	4

REMARKS.

1. Realizing that it is the patriotic duty of the department to be as economical as possible, the State Forester is making no new or specific recommendations and asking for no new legislation this year.

2. The efforts of the department to assist in the production of wood for fuel and its economic distribution and more common use will be given due consideration the coming year.

3. With our present high prices for spraying materials, tools, equipment and labor our appropriation for moth work will go only two-thirds as far as under normal conditions; hence the necessity for greater efficiency. Arsenate of lead costs over 3

cents a pound more than last year, and three times as much as it did four years ago. The rise in price will mean an extra expense of nearly \$40,000 for this insecticide alone over last year's prices.

4. We have a large supply of stock in the State nurseries, and in order to keep up the interest in reforestation, and that individuals may take advantage of this opportunity to plant waste lands, the State Forester is authorized by the Governor and Council to sell to any person who will plant them in Massachusetts, pine transplants (small trees three to four years old) for \$7, a thousand, packed and ready for shipment. The number allowed is not less than 1,000 or more than 10,000 to a person. Send orders to the State Forester, State House, Boston, Mass.

5. The redistricting of the moth work according to county lines will aid us in our co-operative work with the county agricultural agents and forest fire division men who have similar districts. Mutual assistance and understanding greatly aids in accomplishing results.

6. Were it not for the abnormal conditions existing because of the war, as referred to in that portion of this report dealing with State forests, I should make a specific recommendation that sufficient funds be appropriated to enable the planting of at least 1,000 acres of State-owned lands the coming year. As it is, I leave to the wisdom of the General Court the expediency of such action.

7. The State Forester's Department stands ready to advise and assist Massachusetts citizens in the proper development of their woodlands. It is to be hoped that in our enthusiasm to produce wood fuel at present high prices, we may not slaughter trees that rightfully should be retained for our future industries. There are plenty of woodlands in all sections of the State that are really in great need of improvement thinning. All the cordwood necessary can be derived by practicing modern economic methods, and the results will be along the line of conservation of the right kind.

F. W. RANE,

State Forester.

